



GOVERNMENT OF INDIA
TARIFF COMMISSION

R E P O R T
ON
The Continuance of Protection
TO THE
Ball Bearings Industry and the Grant of
Protection to other Rolling Bearings

BOMBAY
1965

PRINTED IN INDIA BY THE MANAGER GOVERNMENT OF INDIA PRESS
NASIK AND PUBLISHED BY THE MANAGER OF PUBLICATIONS DELHI-6
1966

Price: (Inland) Rs. 14.50 (Foreign) 33s. 10d. or \$5 22 cents.

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India, Tariff (.....Commission)

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Ball Bearings Industry and the grant of protec-
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GOVERNMENT OF INDIA
MINISTRY OF COMMERCE

New Delhi, the 31st Dec., 1965.

RESOLUTION

Tariffs

No. 7(1)-Tar/65.—The Tariff Commission has submitted its Report on the continuance of protection to the Ball Bearings Industry and the grant of protection to other Rolling Bearings Industry on the basis of an inquiry undertaken by it under Sections 11 (e) and 13 of the Tariff Commission Act, 1951 (50 of 1951). Its recommendations are as follows :—

- (1) Protection granted to ball bearings and adapter ball bearings, not exceeding 51 mm. bore diameter, covered by I.C.T. Item Nos. 72(35), 72(36) and 72(37) should be continued for a further period of three years ending 31st December, 1968 but the protective rate of duty should be raised to 125 per cent *ad valorem*. Further, ball bearings and adapter ball bearings of more than 51 mm. bore diameter and upto and including 100 mm. bore diameter and roller bearings upto and including 100 mm. bore diameter (excluding railway axle box bearings) should be brought within the scheme of protection and subjected to the same rate of duty, namely, 125 per cent *ad valorem*. This duty also should remain in force till 31st December, 1968. Aircraft bearings will also be outside the scheme of protection.
- (2) If the recommendations regarding protection are accepted by Government, the relevant items of the First Schedule to the Indian Tariff Act, 1934 should be amended.
- (3) For the reasons mentioned by the Tariff Commission, the future of the small scale sector of the rolling bearings industry is doubtful. Such units as have made good progress may be given necessary assistance in all possible ways but great caution has to be exercised in allowing any expansion of such units.
- (4) Since the imported raw materials account for only 15 to 30 per cent of the cost of the finished products, and these will progressively be available in the country, it is desirable to encourage the fullest manufacture of rolling bearings by providing foreign exchange for the import of raw materials to the required extent rather than import of finished products.

- (5) Either the Directorate General of Technical Development or the Ministry of Steel and Mines should make an assessment of the demand for various sections of steel required for the rolling bearings industry and co-ordinate the efforts of capable producers of rods, wires and tubes to ensure sufficient production to meet the indigenous demand by the end of the Fourth Five Year Plan.
- (6) While issuing licences for raw materials for the rolling bearings industry for sources other than the General Currency Area and the Dollar Area, Government should first satisfy themselves that producers will be able to secure suitable raw materials from these sources.
- (7) Blanket licences or licences with monetary limits should as far as possible contain a schedule or schedules of the sizes of bearings permitted to be imported and the protective rate of duty should apply uniformly no matter what the end use might be. To the extent possible sizes near the protected type should not be allowed to be imported except by a consumer and that too after a proper check on the quantities needed by him for his own use.
- (8) Periodical meetings between the Ball and Roller Bearings Manufacturers' Association, the State Trading Corporation and the Directorate General of Technical Development should assist in settling import policy which would ensure that the industry's concurrent and prospective capacity is fully employed and that the consumers' needs are regularly and adequately met.
- (9) Early steps should be taken to establish modern design and research facilities in each undertaking as also a central testing laboratory to ensure high standards of quality.
- (10) Government should either control the selling prices of all the manufacturers of rolling bearings or of none.
- (11) Future imports of ball and roller bearings should be recorded in the "Monthly Statistics of the Foreign Trade of India" on the lines indicated by the Tariff Commission.
- (12) Encouragement needs to be given for the establishment of units for the manufacture of specialised tools, jigs and fixtures required by the rolling bearings industry.
- (13) In-plant training facilities should be provided by all the manufacturers and cadres of designers and research workers should be built up.

2. Government have given careful consideration to recommendations (1) and (2) and having regard to the fact that there is no likelihood of any unhealthy competition from imports as the bearings of specifications which are locally produced are banned for import and in view of the rates of customs duty having been rationalised under the Finance

Government propose to continue the rate of duty as at present. Necessary legislation to implement Government's decision will be undertaken in due course.

3. Government have taken note of recommendations (3) to (12) and steps will be taken to implement them as far as possible.

4. The attention of Ball and Roller Bearings Manufacturers' Association is invited to recommendation (8).

5. The attention of Ball Bearings Industry and Rolling Bearings Industry is drawn to recommendations (9) and (13).

ORDERED that the Resolution be published in the *Gazette of India* and a copy thereof communicated to all concerned.

P. K. J. MENON,
Joint Secretary to the Government of India.



REPORT ON THE CONTINUANCE OF PROTECTION TO THE BALL BEARINGS INDUSTRY AND THE GRANT OF PROTECTION TO OTHER ROLLING BEARINGS

This is the fifth tariff inquiry into the continuance of protection to the ball bearings industry and is wider in its scope since the Government of India in the Ministry of Commerce letter No. 7(1)/Tar/64, dated the 12th February 1965 read with their letter of the same number dated 20th April 1965 have directed us to investigate the need for protection to the rolling bearings industry as a whole, covering all types and sizes of rolling bearings, namely, ball bearings (including adapter bearings), roller bearings (cylindrical, spherical and tapered), roller thrust bearings and needle roller bearings. The tariff inquiries held in 1952, 1956, 1960 and 1962 were confined to the question of protection and/or assistance to the ball bearings industry only. The scheme of protection recommended by the Commission after its first inquiry in 1952 and accepted by Government covered ball bearings (i) not exceeding 2" bore dia. adapted for use as parts and accessories of motor vehicles, other than motor cycles and motor scooters (ii) others of all kinds not exceeding 2" bore dia. and not otherwise specified and (iii) adapter bearings not exceeding 2" bore dia. specially designed for use exclusively with power driven machinery. In the case of bearings falling under the first category, the then existing revenue duty of 94½ per cent *ad valorem* was converted into a protective duty at the same rate while for the second category of bearings a protective duty at the above rate was imposed. As regards the third category, a protective duty of only ten per cent *ad valorem* was imposed as that was the maximum rate then permissible under the General Agreement on Tariffs and Trade (GATT). The period of protection which was initially of two years upto 31st December 1954, was extended by Government in consultation with the Commission, first upto 31st December 1955 and later upto 31st December 1956. The Commission's second inquiry was held in 1956 on the basis of which protection was continued to the above bearings for a period of another four years ending 31st December 1960 at the same rate of duty, namely, 94½ per cent *ad valorem* on both ball as well as adapter bearings, since by that time, Government had obtained release from their commitments in respect of adapter bearings under the GATT. The rate of duty was rounded off to 95 per cent *ad valorem* by the Finance (No. 2) Act of 1957. The third inquiry was held in 1960 and, envisaging changes in the production pattern in the industry due to the substantial expansion programme of the sole producer at the time, the Commission recommended continuance of protection for a further period of only two years ending 31st December 1962 at the then existing rate of duty, that is, 95 per cent *ad valorem*. Parts of ball bearings and adapter ball bearings upto 2" bore dia. were also then brought in the scheme of protection. Government accepted these recommendations. The Commission's last and the fourth inquiry

was conducted in 1962 on the basis of which protection to ball bearings including adapter ball bearings, not exceeding 2" bore dia. and parts thereof, was continued for three years ending 31st December 1965. The Government of India in the Ministry of Commerce and Industry by Resolution (Tariffs) No. 18(1)-T.R./62, dated 16th November 1962 accepted the Commission's recommendation and gave effect to it by the Indian Tariff (Amendment) Act, 1962.

2.1. Since the current period of protection to ball bearings industry is due to expire on 31st December 1965, we under Section 11(e) read

with Section 13 of the Tariff Commission Act, 1951 would have normally had to undertake an inquiry and to report to the Government on any further action required in relation to the protection as at present granted to the industry with a view to its increase, decrease, modification or abolition according to the circumstances of the case. In the meanwhile, however as already indicated, on a request made by the Antifriction Bearings Corporation Ltd., Bombay, the Government of India in the Ministry of Commerce letter No. 7(1)/Tar/64, dated the 12th February 1965 read with their letter of even number dated 20th April 1965 have referred to us under Section 11(a) of the Act, the question of protection to the rolling bearings industry as a whole. The scope of our present inquiry therefore **covers not only the question of continuance of protection to ball and adapter bearings beyond 31st December 1965 under Section 11(e) but also the question of grant of protection to other types of rolling bearings referred to above under Section 11(a) of the Tariff Commission Act, 1951.**

2.2. With regard to the inclusion of steel balls for bicycle bearings within the scope of this inquiry the Directorate General of Technical Development (D.G.T.D.) has advised the Ministry of Commerce that the manufacture of steel balls for the bicycle industry has been fully developed and needs no protection. Import of these steel balls is now banned as adequate indigenous capacity has already been established and on foreign exchange considerations. The Ministry has accepted the view of the D.G.T.D. We are in agreement with the Government in this matter.

2.3. As regards axle-box bearings the D.G.T.D. has informed us that since there is only one consumer viz. the Railways, and since the requirements of these bearings are at present comparatively small, bringing these axle-box bearings within the purview of tariff protection does not appear necessary at this stage. There is no existing or prospective manufacturer of aircraft bearings in the country at present and no need arises to include these bearings within the scope of the inquiry. We are of the view therefore that these two categories should also be kept out of scheme of protection.

2.4. Roller bearings adapted for use as parts and accessories of motor vehicles other than motor cycles and motor scooters are already protected in the scheme of protection enjoyed by the automobile industry. Such roller bearings of a specified category fall under I.C.T. item No. 75(11)(v).

2.5. After the inquiry started National Engineering Industries Ltd., Jaipur requested us to postpone it on the ground that it has not yet been able to implement its expansion programme for want of necessary licences for the import of capital goods. We, however, decided that it was not possible to postpone the inquiry.

2.6. *Representations of manufacturers regarding scope of the inquiry :*

2.6.1. Precision Bearings India Ltd., considers it necessary to extend the scope of the inquiry to cover (i) cylindrical roller bearings of bore diameter from 17 m.m. to 65 m.m. inside diameter and (ii) ball bearings above 51 m.m. to 75 m.m. inside diameter. The unit has stated that all popular sizes in the above size-ranges are in its schedule for production during the next two years.

2.6.2. Associated Bearing Co. Ltd., has requested that tapered roller bearings should be included in the scope of the inquiry. The unit has stated that it is equipped to manufacture tapered roller bearings upto 160 m.m. outside diameter.

2.6.3. Antifriction Bearings Corporation Ltd., has asked that the scope of inquiry be extended to cover (i) ball thrust bearings upto 90 m.m. bore, (ii) cylindrical roller bearings upto 50 m.m. bore and (iii) tapered roller bearings upto 70 m.m. bore. In support of its request, it has stated that in the year 1964, it produced ball thrust bearings ranging from 18 m.m. bore to 100 m.m. bore (3/4" to 4"), cylindrical roller bearings from 25 m.m. to 50 m.m. and tapered roller bearings from 20 m.m. to 70 m.m.

2.6.4. National Engineering Industries Ltd. has stated that most of the bearings produced by it are already covered by the inquiry, that there is no important item left out and as such it is not necessary to extend the scope of the inquiry.

2.6.5. In the course of the public inquiry, to which reference is made later, the Ball and Roller Bearing Manufacturers' Association requested that protection be extended to all types of bearings upto 4" bore diameter or at least 3" bore diameter on the ground that the industry is now in a position to make rapid strides towards self-sufficiency, but that capacity was being limited to protected categories, resulting in excess production of these categories, due to uncertainties of the market in the non-protected categories.

2.7. *Nomenclature of the industry.*—The Ministry of Industry and Supply in their letter No. 1-8/64-MEI dated 30th June 1965 informed us that the Advisory Panel set up by Government to review the problems faced by the industry and to make suitable recommendations to Government, had at its second meeting held on 18th January 1965 observed that the industry should be called "Rolling Contact Bearing Industry" to embrace all types of antifriction bearings. The Ministry left it to us to consider the desirability of adopting the above nomenclature

for this industry at the appropriate time. The nomenclature adopted by the International Organisation for Standardisation (ISO) for international use is "Rolling Bearings". We have decided to adopt this term "Rolling Bearings" which apart from international usage, describes the products aptly and briefly.

3.1. We issued a press note on 11th May 1965 requesting firms, associations and individuals connected with the industry and interested in the Commission's inquiry to obtain copies of

3. Method of inquiry. the relevant questionnaires from the Commission's office and submit their replies and views.

Questionnaires were issued individually to all producers, prospective producers, importers, consumers, and raw materials suppliers and associations of all these interests for eliciting the requisite information and statistical data. The Director General of Technical Development, and the Development Commissioner, Small Scale Industries, Government of India, were requested for memoranda on the present position of the industry with particular reference to certain specific points on the large scale and small scale sectors respectively. The Ministry of Steel and Mines (Department of Iron & Steel), the Director General of Supplies and Disposals, the Iron and Steel Controller, the Chief Controller of Imports and Exports, and the Indian Standards Institution were addressed on matters concerning their respective departments. Data regarding c.i.f. prices and landed costs of imported ball/roller bearings were called for from the Collectors of Customs at principal ports, the State Trading Corporation, producers and importers. The Directors of Industries in the States where producing units are located were requested to apprise the Commission of the problems of the industry in their respective States. The Chief Secretaries to State Governments were invited to offer the views of their Governments regarding the general question of protection to the rolling bearings industry. A list of those to whom questionnaires and/or letters were issued and from whom replies or memoranda were received is given in Appendix I.

3.2. The costs of production of ball bearings manufactured by National Engineering Industries Ltd., Jaipur and ball and roller bearings manufactured by Antifriction Bearings Corporation Ltd., Lonavla (Maharashtra) were examined by the Commission's Cost Accounts Officers. The Chairman and Members of the Commission and a few of its officers visited some of the factories in production. A list of factories visited by us and officers of the Commission is given in Appendix II.

3.3. The public inquiry into the case was held on 24th August, 1965 at the Commission's office in Bombay. A list of those who attended the public inquiry is given in Appendix III. The cost figures, and matters arising out of the Cost Accounts Officers' Reports were discussed with representatives of the two costed firms on 25th August 1965.

4.1. The Commission made certain recommendations in its last Report (1962) on matters other than tariffs. These recommendations and the extent to which they have been implemented are as follows:—

4. Implementation of ancillary recommendations (1962).

Recommendation: "In view of economy in cost of production and lower wastage of material (which as it is imported involves saving of foreign exchange) greater flexibility should be allowed to producers to switch over from use of H.C. 1 bars to H.C. 1 tubes for manufacture of bearings."

The Department of Heavy Engineering, Ministry of Industry and Supply, informed the Commission in January 1965 that the recommendation had been accepted. The Advisory Panel for Ball Bearings Industry at its second meeting held on 18th January 1965 decided that, for purposes of estimating the requirements of alloy steel bars and tubes, races for bearings of outer diameter above 40 m.m. should be standardised on tubes and those below on bars. This proposal seems to be acceptable to both Government and the industry.

Recommendation: "Encouragement should be given to the producers by ensuring supply of deep drawing quality M.S. strips for manufacture of cages as this will be more efficient and economical than use of brass."

The Ministry of Industry and Supply has informed us that encouragement is being given to the producers to switch over to steel cages. As copper and zinc have to be imported the change-over to steel cages was considered desirable especially in view of the prospect of indigenous availability of M.S. strips. The matter is further referred to in paragraph 10.10 on raw materials.

Recommendation: "The I.S.I. should expedite formulation of Standard Specifications for ball bearings."

The Indian Standards Institution has informed us that it has published standard specifications for (i) Glossary of Terms Relating to Rolling Bearings (IS: 2399-1964) and (ii) Boundary Dimensions for Rolling Bearings for General Engineering purposes (IS: 2513-1963). It has also completed circulation of draft standards for discussion and is awaiting finalisation in case of (i) Identification Code for Rolling Bearings and (ii) Code of Practice for Installation and Maintenance of Rolling Bearings. The matter is further dealt in paragraph 11.2 on standards specifications.

Recommendation: "Imports of ball bearings should be recorded separately in value and numbers instead of value and weight in the "Monthly Statistics of the Foreign Trade of India". Imports should also be recorded under the additional heads of (i) ball thrust bearings upto 51 m.m. bore diameter and (ii) ball thrust bearings over 51 m.m. bore diameter."

The above recommendation has been implemented. Since April 1963 imports of ball bearings and other antifriction bearings are being recorded in value and numbers in the "Monthly Statistics of the Foreign Trade of India" and also separately for those upto 51 m.m. (2") bore diameter and above 51 m.m. (2") bore diameter.

Recommendation: "The National Engineering Industries Ltd., Jaipur should properly enforce statistical quality control and utilise its electronic machines for the purpose for which they were procured."

Both the Company and the Government have informed the Commission that this recommendation has been implemented. Statistical quality control has since been introduced by the Company and its electronic machines are in use.

Recommendation: "The National Engineering Industries Ltd., Jaipur should take earnest steps to improve its records of production and process costs in order to exercise better control, effect economies and facilitate determination of costs with accuracy."

The Company has informed us that it was endeavouring to keep its records of production and process costs as suggested by the Commission's Cost Accounts Officer. However investigation shows that satisfactory records are not available to determine how machine time is taken up on specific items or how precisely stores and raw materials are used and wastages arise.

Recommendation: "The National Engineering Industries Ltd., Jaipur should explore the possibility of getting its scrap arisings from H.C. 1 steel which are very heavy, processed for re-use."

The Company has reported to us and to Government that it approached steel foundries in different parts of the country for remelting the scrap arisings at their works but these foundries had expressed its inability to convert it for re-use. The suggestion would appear to be impracticable since the process of making steel does not merely consist of melting scrap of a particular composition and casting it into ingots or billets. In the process of melting scrap changes are liable to occur in composition due to loss of some alloying elements and pick up of others. At best, therefore, the scrap arising can be used by foundries or steel makers as raw material since it is particularly low in sulphur and phosphorus content.

4.2. In addition to the above ancillary recommendations which were notified in the Government Resolution on the Commission's Report (1962) the Commission made a few other observations/suggestions in the Report. The implementation of these observations/suggestions is dealt with in the appropriate places.

5.1. Number of units:

5.1.1. At the time of the last inquiry (1962) two units, namely, National Engineering Industries Ltd., Jaipur and Antifriction Bearings Corporation Ltd. Lonavla (Maharashtra) were manufacturing rolling bearings. Nine more units had also been licensed. The names of the units

5. Present position of the industry in organised sector.

and the progress made by them subsequent to the last inquiry are indicated below :—

TABLE 1

S. No.	Name of the Unit	Progress made since 1962
1	Bharat Ball Bearing Co., Ltd., Calcutta.	Commenced production in March 1963. Factory at Ranchi.
2	Associated Bearing Co. Ltd., Bombay.	Commenced production in January 1965. Factory at Chinchwad (near Poona).
3	Precision Bearings India Ltd., Bombay.	Commenced production in January 1965. Factory at Baroda.
4	M. P. Ball Bearings (I)(P) Ltd., (New Haven Steel Ball Corporation Pvt. Ltd.), Bombay.	Progress reported not satisfactory. The Company has informed us that it cannot float a new company as the share market particularly for ball bearings is badly depressed and that it has asked for further extension of its licensed time by six to nine months. It has further stated in its letter to Government that it does not propose to secure any foreign collaboration as it is mostly bringing old machinery as a part of their investment, but it could work it with foreign technicians.
5	Hindusthan Ball Bearings Co. Ltd., Agra.	Licence revoked.
6	Pioneer Bearings, Coimbatore. (Now Coimbatore Pioneer Engineering Co. Ltd.).	Progress reported not satisfactory.
7	Indian Bearings Ltd, Ahmedabad.	Licence revoked.
8	New Commercial Bearings Corp. Ltd., Ahmedabad.	Licence revoked.
9	M. Ct. Muthiah, Madras.	Licence revoked.

Three more units have been licensed after 1962. They are :

1. Indo-Nippon Precision Bearing Ltd., (Formerly Andhra Pradesh Industrial Development Corporation), Hyderabad. Factory at Hyderabad. Expected to commence production by the end of 1966.
2. P.S. Ball Bearing Co. Ltd., Delhi (Factory near Faridabad)—expected to commence production in early 1967.
3. Cz Roller Chains (India), Bombay—expected to commence production by the end of 1965. (Only for needle roller bearings).

The ball and roller bearings industry is placed in the list of industries banned for further licensing under the Industries (Development and Regulation) Act, 1951, except for expansion of existing units on the merits of each case.

5.1.2. The present position of ten units on the licensed list in the large scale sector for rolling bearings is given in table 2.

TABLE 2

Table showing the present position of ten units on the licensed list in the large-scale sector

Sl. No.	Name of the unit	Name of the foreign collaborator(s)	Location of the factory	Products licensed	Products now manufactured
1	National Engineering Industries Ltd., Calcutta.	Hoffmann Manufacturing Co. Ltd., (England).	Jaipur	Ball bearings, roller bearings, tapered roller bearings and railway axle box bearings.	Ball bearings and railway axle box bearings.
2	Antifriction Bearings Corpn. Ltd., Bombay.	Steyr-Daimler-Puch (Austria).	A.G. Lonavla (Maharashtra).	Ball bearings, roller bearings and tapered roller bearings.	Ball bearings, roller bearings and tapered roller bearings.
3	Bharat Ball Bearings Co. Ltd., Calcutta.	Fafnir Bearing Co., (U.S.A.)	Ranchi	Ball bearings, roller bearings and tapered roller bearings.	Ball bearings.
4	Associated Bearing Co. Ltd., Bombay.	Aktiebolaget Svenska Kullagerfabriken (SKF) (Sweden).	Chinchwad, Poona Dist.	Ball bearings and tapered roller bearings.	Ball bearings and tapered roller bearings.
5	Precision Bearings India Ltd., Bombay.	Norma Hoffmann Bearing Co. (U.S.A.).	Baroda	Ball bearings, roller bearings and tapered roller bearings.	Ball bearings.
6	Cz. Roller Chains (India), Bombay.	Nadella-S.A. (France).	Bombay	Needle roller bearings	Expects to commence production in November 1965.

7	Indo-Nippon Precision Bearings Ltd., Hyderabad.	Koyo-Seiko Co. Ltd. (Japan) and Morubemilida Co. Ltd. (Japan).	Hyderabad	Ball bearings, roller bearings and tapered roller bearings.	Expects to commence production in 1966.
8	P. S. Ball Bearing Co. Ltd., Delhi.	Osaka Bearing Mfg., Co. Ltd. (Japan).	Ballabgarh (Punjab).	Ball bearings, roller bearings and tapered roller bearings.	Expects to commence production in early 1967.
9	New Haven Steel Ball Corpn. Ltd., Bombay.	*	Bombay	Ball bearings and roller bearings.	Progress reported not satisfactory.
10	Coimbatore Pioneer Engineering Co. Ltd., Coimbatore.	Not available	Coimbatore	Ball bearings and roller bearings.	Progress reported not satisfactory.

*The company has stated in its letter to Government that it does not propose to secure any foreign collaboration as the plant supplied by the foreigners is mostly old but it would work with foreign technicians.

One other manufacturing unit, Ex-Cell-O India, Bombay has informed us that it has plans to manufacture bearing cups to be used on propeller shafts. These bearing cups are stated to be of a specific nature and used only on the universal joints on the propeller shafts. The Company has entered into technical collaboration with Messrs. Hardy Spicer Ltd., U.K., and Messrs. Galenk-Wellenban GmbH, West Germany for manufacture of propeller shafts and spare parts. Commercial production of bearing cups is expected to commence in six to nine months. The Company has estimated the annual domestic demand for different types of bearing cups at five million pieces.

5.1.3. The cups are used on the universal joint of propeller shafts of automobiles. These are very special types of bearings and not included in the scope of the present inquiry.

5.1.4. A statement showing the details of location of factory, year of commencement of production, products manufactured, technical collaboration, labour employed and capital structure in respect of the five manufacturers in production is given in Appendix IV.

5.2. Capacity :

5.2.1. Table 3 gives particulars of the present capacity (licensed and installed) in respect of the five units in production.



TABLE 3

Table showing licensed and installed capacities

(In thousand Nos.)

Sl. No.	Name of the Unit	Annual licensed capacity (intimated by D.G.I.D.)				Annual installed capacity			Remarks
		Ball bearings	Roller bearings	Tapered roller bearings	Total	Ball bearings	Roller bearings	Tapered roller bearings	
1	National Engineering Industries Ltd.	900	..	42	942 (Single shift)	5000	..	..	5000 (Three shifts) ..
2	Antifriction Bearings Corporation Ltd.	70.5	74	158	302.5 (Single shift)	141	148	316	605* Capacity for roller bearings is given as separate from that for ball bearings.
3	Bharat Ball Bearings Co. Ltd.	2175	150	175	2500 (Double shift)	2175	150	175	2500*
4	Associated Bearings Co. Ltd.	1500	..	900	2400 (Double shift)	1500	..	900	2400* Capacity for tapered roller bearings is stated to be to a large extent, common with that for ball bearings.

1	2	3	4	5	6	7	8	9	10	11
5	Precision Bearings India Ltd.	300	200	300	800 (Single shift)	600	400	600	1600*	Much of capacity for roller bearings is stated to be Common with that for ball bearings.
		6215.5	698	2075	8989*	9416	698	1991	12105	

*On double shift.

The question arose during the public inquiry whether capacity should be assessed on the basis of a two shift or three shift operation considering that the general practice abroad is for this capital intensive industry to work round the clock to reduce overheads. The oldest established unit in this country, the National Engineering Industries has been working on three shifts for over three years, and of the four new units the Bharat Ball Bearings and Antifriction Bearings have been working in many departments on three shifts.

5.2.2. The Planning Commission considered that capacity calculated to give an output of the order of 11 million bearings per annum on two shifts would be sufficient to take care of the demand estimated at 15 million for ball and roller bearings by 1965-66, if the plants work three shifts. The general policy adopted in regard to engineering industries is to reckon capacity on double shift basis. But in view of the capital intensive nature of the industry, the Planning Commission considered it desirable that three shift operation should be maintained in the future (*vide* page 199 of the Programmes of Industrial Development, 1961-66.)

5.2.3. The manufacturers were specifically asked to indicate the number of shifts worked department-wise. The replies are as follows :

1. National Engineering Industries Ltd. 1963—Entire plant worked three shifts.
1964—Entire plant worked three shifts.
2. Antifriction Bearings Corporation Ltd. 1963—Three shifts in four departments, two shifts in five departments and one shift in two departments.
1964—Three shifts in four departments, two shifts in five departments and one shift in two departments.
3. Bharat Ball Bearing Co. Ltd. . 1963—Three shifts in four departments, two shifts in one department and one shift in three departments.
1964—Three shifts in five departments, two shifts in five departments and one shift in one department.
4. Associated Bearing Co. Ltd. . The Company commenced production in January 1965.
5. Precision Bearings India Ltd. . Production commenced in January 1965.

In discussion the view was expressed by all the manufacturers and after consideration agreed to by the Commission that capacity should for the present be assessed on a two shift basis for the new units, partly because they would have problems of training staff for additional shifts, but mainly because at the present state of their development the third shift would lead to a fall in standards of production of a high precision article and risk of damage to expensive specialised machinery. Apart from these considerations, it is obvious that it would be some time before the new units develop enough to build up a market for products of a third shift. It was also agreed that the production of the second shift would normally be equal to that of the first. It should not, however, be difficult for the industry to work on three shifts in about another two or three years if a market is built up and the necessary raw materials

are made available. Considering its capital intensive nature this would be desirable when trained labour is available and diversification of sizes of manufacture is established. The present capacity of the units now in production of 12 million bearings per year (three shifts of National Engineering Industries and two of the other units) would then go up to about 15 millions.

5.3. *Diversification, Production pattern etc. :*

5.3.1. Particulars regarding diversification effected by the industry since the last inquiry, plans for manufacture of new items and proposals for diversification for future, etc. are briefly furnished below unit-wise :—

(i) *National Engineering Industries Ltd. :*

The Company manufactures besides ball bearings, steel balls, axle boxes for railway wagons and locomotives and spindle inserts for the textile industry. It has plans to manufacture roller bearings, tapered roller bearings, steel castings and rolled rings for bigger bearings, besides expanding the ball bearing and axle boxes sections. It has obtained necessary industrial licences for these items. For ball bearings, the manufacturing capacity is upto 30" outside diameter.

(ii) *Antifriction Bearings Corporation Ltd. :*

This unit commenced production of thrust ball bearings in 1961. Subsequently it has commenced manufacture of tapered roller bearings, cylindrical roller bearings, bearings components for special applications and steel shots as grinding media for paint industry. In 1962 it was tooled up for manufacture of 64 sizes of ball thrust bearings [ball thrust bearings upto 51 m.m.—(49) and bearings over 51 m.m.—(15)]. Since then it has tooled up for manufacture of 26 more sizes bringing the total number to 90 [ball thrust bearings upto 51 m.m.—(56) and bearings over 51 m.m.—(34)]. Production of roller bearings commenced in 1963. It is tooled up for 11 sizes of cylindrical roller bearings and ten of tapered roller bearings. The numbers are proposed to be increased in the course of the next year by four in the case of cylindrical and five in the case of tapered bearings. It intends to cover gradually all the cylindrical as well as tapered roller bearings range of sizes upto bore diameter of 70 m.m. in the course of the next three to four years, subject to the outside diameter being within 135 m.m.

(iii) *Bharat Ball Bearing Co. Ltd. :*

The Company manufactures only ball bearings whose production commenced in March 1963. It will take up manufacture of cylindrical roller bearings and tapered roller bearings in 1966. It proposes to manufacture axle boxes complete with roller bearings during the next three years. It contemplates the manufacture of spherical roller bearings also. These proposals for expansion will be taken up in three phases—first phase being to achieve its licensed capacity (two shift basis) of 2.175 million ball bearings, 0.150 million cylindrical roller bearings and 0.175 million tapered roller bearings ; the second phase being to start the production of railway axle boxes complete with cylindrical or spherical or

tapered roller type bearings, and the third phase being to double the licensed capacity to five million bearings per year bringing its eventual capacity (two shifts) to 3.775 million ball bearings and 1.225 million roller bearings. For the expansion and for manufacture of axle boxes (36,000 nos.) the company has received letters of intent from Government. The present range of production of ball bearings is upto an outer diameter of $4\frac{1}{2}$ " , the range to be extended in the expansion programme. It has planned for production of 54 sizes of ball bearings. Regarding roller bearings its plans are to manufacture in the first instance seven sizes of cylindrical and nine sizes of tapered bearings.

(iv) *Associated Bearing Co. Ltd. :*

The Company commenced production of ball bearings in January 1965, and tapered roller bearings in April 1965. It also produces specialised accessories of textile machinery, namely, pendulum weighting arms with cradles and top rollers, centring sleeve inserts and tape tension pulleys. It has no plans to manufacture ball bearings above 51 m.m. and adapter ball bearings. As regards tapered roller bearings, it is equipped to manufacture upto 170 m.m. outside diameter. Its installed capacity (double shift basis) for manufacturing ball bearings (upto 51 m.m. bore diameter) is 1.5 million per annum and that for tapered roller bearings 0.9 million. For some operations, the capacity is common for both ball and tapered roller bearings. Its production programme upto 1969 includes manufacture of tapered roller bearings ranging from 15.875 m.m. to 82.55 m.m. bore diameter and from 40 m.m. to 136.525 m.m. outer diameter with width of assembled tapered roller bearings ranging from 13.25 m.m. to 36.512 m.m. As regards ball bearings, these ranges are ten m.m. to 45 m.m. of bore diameter, 31 m.m. to 85 m.m. of outside diameter and nine m.m. to 21 m.m. of width.

(v) *Precision Bearings India Ltd. :*

This unit commenced production of ball bearings in 1965. Its installed capacity of 1500 bearings a day on three shift basis is common for ball and roller bearings. Production of roller bearings will commence this year. It has applied for an industrial licence for an increase in capacity for 50,000 axle box roller bearings and 25,000 spherical roller bearings annually. The bearings sizes planned for production upto 1968 is 225 in number, covering all standard bearings from 8 m.m. inside diameter to 70 m.m. inside diameter in both annular or closed type ball bearings and cylindrical roller bearings. It also expects to cover all ball bearings sizes from 10 m.m. to 60 m.m. inside diameter with metal dust shields and from 15 m.m. to 30 m.m. inside diameter with rubber dust shields.

5.3.2. A total of 192 sizes of ball and roller bearings are at present either banned or restricted for import. The D.G.T.D. has stated that the annual policy for import of bearings is evolved taking into consideration the actual performance of the indigenous manufacturers of bearings and their projected programme in such a manner that import of bearings manufactured in the country is either totally banned or restricted according to the quantum of production *vis-a-vis* demand for

the particular type of bearings. This procedure has worked satisfactorily so far and there has been no serious complaint of scarcity of indigenously manufactured bearings. The Advisory Panel for ball and roller bearings could not agree to the proposal of its study group that such of the bearings as are taken up for manufacture indigenously should be banned for import from the date when manufacturers start the first operation as the mere fact that a manufacturer has tooled up for production for certain sizes would not ensure availability of good quality bearings to the consumers. A comparative study of restricted/banned sizes and the manufacturing programme of the producers shows that of the 192 sizes which are either banned or restricted for import there is competition only in 80 sizes. The number of manufacturers who have taken up the production of various banned/restricted sizes is as shown below :

TABLE 4

No. of sizes	No. of manufacturers who have them on their manufacturing programme
96	1
46	2
18	3
16	4
16	Not shown by any manufacturer in his Programme
192	

National Engineering Industries Ltd. has sent its manufacturing programme only for the year 1965-66. It is not in a position to forecast future production programme. सत्यमेव जयते

TABLE 5

Size of bearing restricted or banned for import (S.K.F. Catalogue numbers)	Number of sizes	Number of manufacturers who are either manufacturing the size or who have it on their manufacturing programme
1	2	3
6200 to 05	6	4
6303 to 05	3	4
6300	1	4
6206 to 09	4	4
6306 to 07	2	4
	16	

	1	2	3
RLS 5 to 8		4	3
6001 to 02		2	3
6004		1	3
6210		1	3
RLS 9 to 12			3
6308 to 10			3
72078		1	3
6211 to 12		2	3
		18	
RMS-8		1	2
EES to 8		3	2
7204		1	2
L 17		1	2
B6 to B 8		3	2
06 to 08		3	2
1506E		1	2
RMS 9 to 16		8	2
1206—08		3	2
010, 012, 016		3	2
T12, T16		2	2
1508E to 11E		3	2
7308B, 10B		2	2
020, 024		2	2
30204 to 09		4	2
30302, 06		2	2
32211 to 14		3	2
32306		1	2
		46	
RLS 4		1	1
RMS 5 to 7		3	1
EE 3		1	1
7203		1	1
ALS 8A		1	1
1200		1	1
RL 4 to 8		4	1
1305		1	1
51103 to 05		3	1

1	2	3
B 5	1	1
51202 to 05	4	1
51305	1	1
T6 to T8	3	1
RLS 13 to 16	4	1
09	1	1
RL 9 to 13	4	1
51106 to 10	5	1
EW 1½ (Hoffman)	1	1
51206 to 10	5	1
09, 011, 013 to 015	5	1
51306 to 10	5	1
T9, T10, T14	3	1
51407	1	1
52206	1	1
545 ACD (Hoffman)	1	1
MSN 14 (Hoffman)	1	1
E 20	1	1
7212	1	1
51111 to 15	3	1
51211 to 15	3	1
018	1	1
022, 023	2	1
51312, 15	2	1
T 18, T 20	2	1
1515 E, 1517E	2	1
1215	1	1
N 205 to 210	6	1
N 306 to 310	5	1
1217	1	1
51116, 20	2	1
026	1	1
EL 9	1	1

5.4. Expansion :

5.4.1. The capacities licensed for expansion of existing units and for the new units is given below :

TABLE 6
(In million nos. per annum)

Sl. No.	Name of the Unit	Ball bearings	Roller bearings	Tapered roller bearings	Needle Roller bearings	Total and likely date of materialisation
(1) <i>Expansion of Existing units :</i>						
1	National Engineering Industries Ltd.	0.90	0.24	0.318	..	1.458 (Single shift) (End of 1966).
2	Bharat Ball Bearing Co. Ltd.	1.60	..	0.90	..	2.50 (Double shift) (Middle of 1967) (only a letter of intent issued).
(2) <i>New Units :</i>						
1	Cz Roller Chains (India), Bombay.	..	..	..	0.312	0.312 (single shift) November 1965.
2	Indo-Nippon Precision Bearing Ltd.	0.60	0.24	0.60	..	1.44 (Single shift) (1966).
3	P. S. Ball Bearing Co. Ltd.	0.90	0.24	0.60	..	1.74 (Single shift) (End of 1966).
4	New Haven Steel Ball Corporation.	0.90	0.30	..	..	1.20 (Double shift) (Progress not satisfactory).
5	Coimbatore Pioneer Engineering Co.	1.00	0.50	..	..	1.50 (Double shift) (Progress not satisfactory).

5.4.2. If the above schemes materialise, then the present capacity of the industry mentioned in paragraph 5.2 will be increased in the coming years as under :—

TABLE 7
(In million nos. per annum-capacity on double shift)

	Ball bearings	Roller bearings	Tapered roller bearings	Needle roller assemblies	Total
Increase by end of 1965 .	..	..	..	0.624	0.624
Increase by end of 1966 .	4.80	1.44	3.036	0.624	9.90
Increase by end of 1967 .	6.40	1.44	3.936	0.624	12.40
Increase after 1967 .	8.30	2.24	3.936	0.624	15.10

Excluding Cz Roller Chains (India), whose product is a specialised one, and New Haven Steel Ball Corporation and Coimbatore Pioneer Engg. Co., the extra capacity in sight, with National Engineering Industries Ltd. on three shifts, and the remaining units on two shifts, would be about 10.25 million bearings, bringing up the total capacity including established capacity, to about 22.35 millions on two shifts (National Engineering Industries Ltd. on three) and about 30 millions on three.

5.5. Economic size.—In the rolling bearings industry in advanced countries a capacity of about 30 to 40 million bearings per annum is considered economic. This subject was discussed at the second meeting of the Advisory Panel for the ball and roller bearings industry and it was agreed that for our country an output per unit of about 10 million bearings per annum may be considered as economic for the present. The Panel also agreed with the recommendation of its study group that preference should be given to the expansion of existing units upto economic levels of production. Though we have not thought it necessary or practicable at the present stage of development of the industry to make any enquiry into this issue, this opinion of experts would appear to offer a good guideline. It follows that any further expansion of the industry would only have to be through the expansion of the five units now in production, and the five others licensed to set up manufacture.

5.6. Production.—The industry has made good progress in recent years. In 1952 the production was only 0.4 million bearings, and no interest was taken in the industry by any new entrepreneurs till 1960. The production stood at 2.7 million in 1960, and rose to 5.8 millions in 1964 covering nearly half the country's requirements both in value and numbers. The statement in Appendix V gives unit-wise production of rolling bearings for the years 1962, 1963, 1964 and 1965 (January-June). The table on next page shows the total production during these years. As new units have gone into production since the last inquiry, there has been a steady increase in the volume of production of ball bearings. Production went up from 1.56 million bearings in 1957 to 3.96 millions in 1962 and 5.81 millions in 1964. During the first half of 1965 the production showed a further spurt and stood at 3.80 millions. Production of heavy duty and high precision bearings has not yet been taken up. No unit is bound down under its licence to manufacture specific types and sizes of bearings. The field is open to all of them, to take up production of a wide range of types and sizes of bearings within their licensed capacity. The production of bearings above 51 m.m. to 100 m.m. bore diameter still forms a small proportion of total production. Production of ball bearings above 100 m.m. bore is negligible. As regards roller bearings whose production was started in 1963, the increase in production has been gradual. While the production of tapered roller bearings over 51 m.m. bore diameter is small compared to that below 51 m.m. size, there has been no production of cylindrical roller bearings about 51 m.m. bore diameter.

TABLE 8

Statement showing total indigenous production of rolling bearings

(In thousand Nos.)

Year	Ball bearings			Adapter ball bearings			Roller bearings		
	Upto 51 m.m. bore diam.	Above 51 m.m. & 100 m.m.	Total	Upto 51 m.m. bore diam.	Above 51 m.m. & 100 m.m.	Total	Upto 51 m.m. bore diam.	Above 51 m.m. & 100 m.m.	Total
1962	.	3921	8	Nil	3929	28	0.5	Nil	28.5
									(Assembled)
1963	.	4937	4	Nil	4941	29	0.3	Nil	29.3
1964	.	5555	15	Nil	5570	20	0.7	Nil	20.7
1965 (January-June)	.	3608	13	63 (Nos.)	3621	47	1	Nil	48
									103
									22
									3
									5
									Nil
									16
									215
									128

NOTE.—The DGTD has furnished the following figures of production of railway axle box bearings by National Engineering Industries Ltd., (NEI) the only unit now producing them :—

1962	48354
1963	57772
1964	51960
1965 (Upto May)	36344

NEI's licensed capacity is 39,960 on two shifts. It has been granted a licence for expansion to 72,000 (two shifts). Two other units have also been licensed.—Bharat Ball Bearing Co. (Letter of intent only issued)—72,000 (three shifts) and Indo-Nippon Precision Bearings Co.—48,000 (single shift).

5.7. Estimated future production :

National Engineering Industries Ltd. has furnished its estimates of production of bearings for 1965-66 at only four million nos. though on its past performance the figure should be nearer to five millions. For later years, it is not able to give estimates pending receipt of import licence for capital goods for implementing its expansion programme. Taking its figure as 4.5 million nos. for each of the years 1965 to 1968 and the estimates furnished by the other four units in production, the production in 1965 and during the next three year period should be as follows :

TABLE 9

(In million nos.)

Year	Ball bearings (*)	Roller bearings
1965	8.8	0.6
1966	9.9	1.2
1967	11.5	1.7
1968	13.2	2.0

(*) Production expected is of sizes upto 100 m.m. only.

NOTE : 1. Adapter ball bearing accounts for only 0.2 million Nos.
2. Unit-wise data are given in Appendix VI.

These figures will go up appreciably if the expansion schemes of National Engineering Industries Ltd. and Bharat Ball Bearings Co. Ltd. are expedited, and if the five new units are able to establish themselves exactly as they have programmed.

6.1. The Development Commissioner, Small Scale Industries has reported the existence of 32 small scale units which manufacture ball bearings with an annual capacity of 1.05 million bearings. Of these, 28 are located in the Punjab and one each in West Bengal, Gujarat, Maharashtra and Delhi. Ball bearings manufactured by these units are used for slow moving vehicles and machines, such as, rickshaws, bullock-carts, grinding machines, chaff cutters, lawn mowers, etc. They mostly use general purpose machinery and untested materials. They are able to sell in the market to-day owing to the shortage in supply and their ability to sell at prices 40 to 50 per cent below those of the organised sector. In its last Report the Commission had recommended that screening of these units by the Development Commissioner was desirable and that only suitable units should be encouraged in a high-precision line which would become increasingly competitive. From the technical advice available to us it would appear that an industry like rolling bearings which requires high precision and sophisticated technical know-how as well as tested quality materials is hardly suited for small scale manufacture. A qualified engineer of the SKF organisation estimates that the

absolute minimum investment to make just one size of good bearing would be about Rs. 15 lakhs and that even a unit of this size would in course of time be unable to compete with the large sector when its capacity is built-up to a more economic size than at present. We are therefore doubtful of the future of this sector. However, so long as it uses general purpose machinery a shift in the line of production, when quality rolling bearings become available at lower prices would be easy. Such units as have made good progress in the manufacture may be given necessary assistance in all possible ways but great caution has to be exercised in allowing any expansion of such units. We have had difficulty in assessing the capacity and production of units in this sector since most of them have not replied to our questionnaire. However, a reply from one unit in Maharashtra gives capacity and production which vary widely from the figures of the Development Commissioner, Small Scale Industries. For this reason, the estimates of the Development Commissioner, Small Scale Industries, whose difficulties we appreciate, have to be treated with some caution.

6.2. The D.G.T.D. was specifically asked to indicate if in its opinion the small scale manufacturers could work as ancillary units to the large scale sector. To this the D.G.T.D. has replied that since each component of a bearing has to be according to pre-determined tolerances and properly matched for satisfactory performance it is doubtful whether at the present stage any ancillary unit for manufacture of a few items could be developed. However, it may be possible under the present circumstances to entrust items like dust shields, rubber seals, swaged rivets etc. to ancillary units. It is suggested that the Development Commissioner, Small Scale Industries may look into the possibility of encouraging small scale manufacturers to work as ancillaries of this nature to the large scale sector in consultation with the D.G.T.D.

7.1. In estimating future demand the life of rolling bearings now in use is a significant factor. The life expectancy of bearings and appliances has a direct bearing on replacement

7. Domestic Demand.

demand. Various assumptions have been made by different bodies regarding the life of rolling bearings. The Planning Commission in its "Programmes of Industrial Development 1961-66" assumed an average life of seven years. One importer (International Trade Links, Bombay) is of the view that it is not correct to take the life of a bearing as seven years. In a survey it found that wherever there was continuous use and the load and speed were high the bearing had to be replaced every year or at the most every two years. A study of the manufacturers' technical literature indicates that individual bearings of the same design and material sometimes have different lives even when working under near identical conditions.

7.2. *Replacement demand.*—In its last Report the Commission adopted 22 per cent of O.E. (Original equipment) demand as replacement demand (2.15 million for replacement as against 9.1 million for original equipment). According to the D.G.T.D. and the Advisory Panel

it is five per cent of stock. National Engineering Industries Ltd. has taken the overall figures for replacement demand at about 25 per cent. the figure varying according to the consuming industries, the figures being 22% for electric fans, 50% for electric motors and pumps, 33% for machine tools, 11% for textile machinery, ring frames and carding engines, 33 1/3% for automobiles, 20% for cycle rickshaws and chaff cutters, 16 3/5% for sugar machinery, flour mills and miscellaneous and nil for conveyers. So many factors come into play, inclusive of the maintenance care taken by the consumer that we have come to the view that the estimate of the National Industrial Development Corporation (N.I.D.C.) may be accepted and replacement demand placed at five per cent of bearings in use. This figure is estimated to be equivalent to 30 per cent of the current annual demand.

7.3. *Substitution.*—Rolling bearings can be used in any application requiring bearings with very few limitations. One limitation for example is where a split bearing is required *e.g.*, on a crankshaft. In first costs, rolling bearings are higher priced than sintered bush bearings or plain bush bearings. Rolling bearings can stand upto higher temperature working conditions than sintered bearings. Normal rolling bearings can be used upto a working temperature of 120°C and bearings can be specially designed for working upto 250°C. A sintered bearing cannot normally be used where the temperature exceeds 80°C. Rolling bearings also have a higher load carrying capacity. On the whole we do not think that substitution is a problem except marginally, and that when good ball bearings are available at reasonable cost, they are not likely to be replaced by sintered bearings which are of special applicability where speeds are low, loads light and are intermittent.

7.4. In its "Programme of Industrial Development—1961-66", the Planning Commission estimated the total annual requirements of ball and roller bearings for 1965-66 at 12.3 millions. Its similar estimates for 1966-71 are not yet available but would obviously be based on the expansion envisaged for the main consuming industries like electric fans, motor vehicles, textile machinery etc. The Tariff Commission is not in a position to forecast the demand for rolling bearings on such a breakup since the estimated targets for the expansion of these industries and the apportionment of national resources to each of these industries could only be made by Government on the advice of the Planning Commission. Our forecast would for the present be only on the basis of past experience and current trends. In its last Report (1962), the Tariff Commission estimated the current demand during 1962 at eight million pieces for ball bearings of protected categories and forecast increases for succeeding years at 20 per cent per annum so that the demand for 1965 would be 14 millions. The figures of availability, *viz.*, the sum of production and imports of these categories during 1963 (7.95 millions) and 1964 (8.17 millions) show that the demand has been substantially below anticipations.

7.5. We have received information from the D.G.T.D. about the targets of capacity set up for the main consuming industries for 1970-71, and the estimates based on these targets of demand for rolling bearings

(vide Table No. 10). These are published in the booklet of the N.I.D.C. Comparison with figures used in our previous inquiries is not strictly possible because the industries included are not the same. However, some indications are available that the estimates of N.I.D.C. made in 1963 are likely to be over-estimates now. The demand for bearings for fans for example has been shown as 7.95 million numbers for 1970-71. During the present inquiry the representative of Fan Makers' Association pointed out that the progress of the industry has been much lower than anticipated and that the production at the end of the Fourth Five Year Plan will only be as much as was targetted for the Third Plan. In consequence the demand for rolling bearings will only be four million numbers as against 7.95 million numbers estimated by the N.I.D.C. There is a similar over estimate in the case of electric motors. During

TABLE 10
Estimates of demand for 1970-71

Sl. No.	Industry	1970-71 Target of capacity	(Figure in thousand nos.) Requirements		
			Ball bearings	Roller bearings	Total Ball and roller bearings
1	2	3	4	5	6
1	Railway Rolling stock .	62,750 Nos.	..	354	354
2	Motor Cars	45,000 ,,	805	935	1,740
3	Jeeps & Station Wagons .	20,000 ,,	323	343	666
4	Commercial Vehicles .	150,000 ,,	1,185	3,668	4,853
5	Motor Cycles & Scooters	150,000 ,,	975	237	1,212
6	Electric Motors .	Upto 150 KW— 8000 MW Above 150 KW— 2000 MW	2,640	85	2,725
7	Electric Fans	4 Million	7,950	..	7,950
8	Diesel Engines	140,000	117	15	132
9	Power Drive Pumps . .	300,000	598	38	836
10	Heavy Machinery Plant & Mining Machinery Plant	315,000 Tonnes	1,439	..	1,439
11	Chaff Cutters	..	305	124	430
12	Crawler Tractors . . .	1,200	49	44	93
13	Heavy Earth Moving Machinery	..	17	10	27
14	Tractors	25,000	878	292	1,170
15	Machine Tools	Rs. 100 Crores	765	1,164	1,929
16	Textile Machinery . . .	..	1,900	1,318	3,218
17	Sugar Machinery	Rs. 15 Crores	111	4	115
TOTAL			20,058	8,631	28,689

1	2	3	4	5	6
18	Other users not specially stated above—15% of the above figures .		981	432	1,413
	TOTAL .	21,039	9,063	30,102	
19	Replacement Reqt. . .		4,850	2,266	7,116
	TOTAL .	25,889	11,329	37,218	
	Allowance for Stock Building .				170
	GRAND TOTAL .				37,388
	Say .				37.4 million

[Source : NIDC booklet "Survey of demands for Intermediate and Secondary Engineering products during the Fourth Plan Period."]

our recent inquiry into the electric motors industry, the Indian Electrical Manufacturers' Association submitted an estimate of demand for electric motors in the range of one to 500 h.p. at 504,600 electric motors for 1970-71. Assuming that motors below one h.p. which constitute about ten to 12 per cent of total production will use sintered and other bearings, the demand for this industry will only be one million numbers against the estimates made by the N.I.D.C. of 2.72 million numbers. The third case of over estimate relates to chaff cutters where the demand for 1970-71 was placed at 430,000 numbers as against 50,000 for the Third Plan. After excluding the over estimates in these three cases, the requirements of ball bearings for 1970-71 will come down from 37.4 million to 31.8 million numbers.

7.6. The estimate of domestic demand for all types of ball and roller bearings for 1965-66 which has been accepted by the Planning Commission (Perspective Division) and the N.I.D.C. is 20 million (*vide* Appendix VII). The estimates of the Ball and Roller Bearings Manufacturers' Association are much lower. The Association places the figures for 1965-66 at 12.76 millions and allowing for an annual increase of 10 per cent the figure for 1970-71 at 20 millions. We are inclined to think that the latter figure is too conservative considering that the demand went up from eight millions in 1962 to a little under 13 millions in 1965. Considering all the available material in the matter we are of the view that an annual increase of 15 per cent would be realistic. Placing the consumption under all heads at 14 millions in 1965 and allowing for an increase of about 15 per cent, the requirements for 1966,

1967, 1968, 1969 and 1970 should be 16, 18.5, 21, 25 and 30 millions respectively. This last figure more or less agrees with the adjusted figures of the N.I.D.C. dealt with by us in the previous paragraph. The demand for 1970 is therefore not likely to exceed 30-35 millions.

7.7. As regards axle box bearings the Railway Board appears to be reviewing the entire position, and the demand would finally depend on the extent to which the use of bush bearings is replaced with roller bearings in railway wagons. Since however we have decided to exclude this item from our investigation we do not wish to attempt any estimate of demand in this connection.

8.1. We expect the present capacity of the industry which is about 12 millions of bearings to go up to about 18 millions when the 8. Future Production expansion schemes are completed towards the middle or end of 1967, and further to about 23 millions when the three of the five new units, which have made some progress, go into full production, which should not be later than 1968. The industry should, therefore, be in a position to meet a substantial part of the indigenous demand by that year.

8.2. Though almost all production today is in sizes below 2", the industry has machines and tools for larger sizes of which there is a little production at present. The assessment of manufacturing capability as stated in the replies we have had to our questionnaire, and as made by the Study Group II of the Advisory Panel on ball bearings is as below:—

TABLE 11

Manufacturing capability of the five existing producers

Type of bearing	Capability according to Study Group	Capability according to manufacturers (excluding N.E.I.)
	(Bore diameters)	
Single row deep groove ball bearing	80 mm	75 mm
Double row self-aligning ball bearing	85 mm	50 mm
Single row angular contact ball bearing	110 mm	55 mm
Double row angular contact ball bearing	45 mm	(not indicated)
Spherical roller bearing	Nil	Nil
Cylindrical roller bearing	90 mm	100 mm
Taper roller bearing	100 mm	90 mm
Ball Thrust bearing	110 mm	110 mm

National Engineering Industries Ltd. has stated that it can manufacture bearings upto 30" outer diameter. It has, however, only recently manufactured some bearings over 2" bore diameter. In its reply to suggested scope of the inquiry, it stated that an extension over this size is not necessary. We are, therefore, not inclined to make any assessment of its capability to produce bearings over 2" bore dia. which in any case would appear to depend on the completion of its expansion plants and import of new machinery.

8.3. A study of the production programme of the manufacturers shows that in cylindrical roller bearings only the common types without any special features are planned for production during the next three years. We are informed that there is appreciable demand for bearings with special features such as lips on the outer rings and lips both on the inner and outer rings. We are also informed that special machinery is required for incorporating such features in the bearings which are not presently available with the manufacturers. It is desirable that the manufacturers in their expansion programmes should keep this aspect in mind.

8.4. The industry is now in a position to meet the indigenous demand in full in respect of protected sizes and types and with new units likely to come into production during the next three years, it is desirable to encourage diversification of the production of bearings in the next larger sizes. This is needed not only to take full advantage of available capacity, but also to avoid the unnecessary drain of foreign exchange which could be better used to import raw materials rather than finished products. One of the study groups of the Advisory Panel observed that the industry has planned to meet the requirements of the country in respect of sizes covering 45 per cent of the total demand and that a further nine per cent can be met if production can be set up in economic lots of sizes. The remaining 46 per cent will have to be tackled late in the Fourth Plan. We asked the Ball and Roller Bearings Manufacturers' Association of India to furnish us with a realistic programme of production which they would be willing to set up if tariff protection now available to ball bearings up to 2" bore were to be extended to all rolling bearings up to 4" bore. In doing so we requested them to allow for capacity which would be installed within the next three years with existing plant and equipment, and plant and equipment for which import licences have already been issued. We also asked them to ignore the capacity of new units not yet in production. This we did partly to avoid taking into account capacity which would be beset with teething troubles, and partly to provide a possible margin of safety against errors of forecast. The programme gives the following figures of estimated capacity and demand by the end of 1968.

TABLE 12

(In millions)

Sizes of bearings	Current produc- tion (1964)	Capacity on two shifts	Capacity likely to be achieved by 1968	Demand (based on Planning Commis- sion's estimates for 1965 with 20% extra per year)	Associa- tion's estimates of demand
Ball bearings 2" to 4" bore	0.047	1.24	0.825	0.80	0.63
Cylindrical roller bearings upto 2" bore	Nil	0.67	0.645	1.750	0.48
Cylindrical roller bear- ings 2" to 4" bore	Nil	0.30	0.225	0.029	0.083
Tapered roller bearings upto 2" bore	Nil	1.77	1.835	1.660	1.11
Tapered roller bearings 2" to 4" bore	Nil	1.22	1.215	1.18	0.99

We are satisfied that these figures are a reasonable basis for future action. If the necessary raw materials are made available the industry could meet a significant part of the indigenous demand for bearings upto 4" by 1967, and perhaps a substantial part within a further two years.

8.5. This production has, in our view, to be encouraged. It would mean a burden on the consumer for the time being, but considering that the demand for sizes over 2" is relatively small, the additional burden resulting from tariff protection would not be too heavy. Since imported raw materials account for only 15 to 30% of the cost of the finished product, and these will progressively be available in the country, it is desirable to encourage the fullest manufacture of rolling bearings by providing foreign exchange for the import of raw materials to the required extent rather than import the finished products. For this reason the grant of protection in advance of production, provided there are realistic programmes, is desirable. We have taken the view that the programme given to us is realistic and have made suitable recommendations in this respect later in this Report.

9.1. The nature of the product and the importance of precision and quality control at every stage call for a high level of skilled labour in this industry.

9. Man-Power.

9.2. In our questionnaire to the producers we had specifically asked whether they were experiencing any difficulties owing to the

shortage of specialised technical personnel and if so what arrangement they had made to overcome these difficulties. We had also asked them to indicate if they had taken any steps to set up either a training school or to introduce an apprentice scheme to train their workers for their highly specialised skills. In reply to our questionnaire Associated Bearing Co. has informed us that it has about 25 foreign technicians employed for a limited period and they are working as departmental chiefs and instructors and at the same time are training Indian personnel. Special classes are also being arranged for theoretical training. An apprentice training school has been organised and is under development and the company adheres to the regulations of the Apprentice Act. Bharat Ball Bearing Company Limited has informed us that it is facing some difficulties owing to lack of specialised technical personnel as sufficient experienced persons are not available. To overcome this difficulty it has established a training scheme for graduate engineers, supervisory staff and workers. Further, it sends its engineers abroad for specialised training in the factory of its technical collaborators. It also calls specialists from its collaborators in the U.S.A. as and when required for advice on technical matters and also for training its personnel. Precision Bearings India Ltd. has informed us that it has experienced no unusual problems of specialised personnel other than normal difficulties in establishing a new operation. At the commencement of its operations it brought technicians from the U.S.A. to train a cadre of employees in each specialised operation and these people are giving new employees on the job training to the extent required as they are recruited. It is hiring new employees particularly from the State sponsored training schools and finds that these workers once they have undergone additional training given to them are able to set up, operate, and maintain its production machinery. Antifriction Bearing Corporation Ltd. has informed us that in a precision mass production factory, the workers and supervisory staff engaged in producing ball or roller bearings should have specialised skill in their jobs. Since it is the first factory in India to engage in the production of cylindrical and tapered roller bearings, it could not initially find readily trained labour, nor could it draw on already experienced supervisory personnel. It had to make arrangements to train its labour as well as supervisory staff in a sort of in-plant training system. It claims that within a period of less than two years it has already been able to utilise fully the production capacity of the machines installed in its factory. National Engineering Industries has informed us that its tool room and maintenance require highly specialised personnel for which it is experiencing difficulties. To overcome this it takes persons from the Industrial Training Institute and also has set up a training school under the Apprentice Act. This being a highly specialised industry it is difficult for it to get proper personnel for design and development work. It feels that it may have to get some specialised staff from abroad.

9.3. The replies of the manufacturers show that two of the producers already have apprentice schools, one has a sort of in-plant training scheme and two others rely on the State-sponsored training schools to find skilled workers. It is admitted that there is difficulty in finding

workers with the requisite degree of skill for operating and maintaining the machines. Considering the above we would support the Advisory Panel's recommendation that (1) in-plant training facilities should be provided by all the manufacturers and (2) cadres of designers and research workers should be built up.

10.1. The principal raw materials required for rolling bearings are : (i) high carbon chromium steel bars/tubes/wires, (ii) deep drawing quality mild steel strip, (iii) m.s. rivet wire, (iv) brass rod/strip, (v) grinding wheels, and (vi) chemicals. The basic raw material, high carbon chromium steel bars or tubes and wires conforming to EN 31, SAE 52100 or similar other specification continues to be wholly imported. Of the other materials, brass strip and rod are indigenously available. Deep drawing quality steel strip is partly imported as indigenous production is not sufficient to meet the demand. Special rivet wire required for some types of cages is imported. Grinding wheels with special bonding are not available from indigenous sources, though one of the manufacturers has reported some success in using indigenous grinding wheels with ceramic bond. A large percentage of the requirements of the bearings industry (somewhere near 60%) is being met at present out of indigenous production. Efforts are being made by the indigenous manufacturers of grinding wheels to set up the production of special bonded wheels required by the bearings industry.

10.2. In paragraph 8.4 of its Report (1962) the Commission noted that capacity for high carbon chromium steel wire and bars would be set up by the end of 1965 and made a suggestion that Government might assess the demand of the industry for tubes and plan their manufacture well in advance so as to avoid continued dependence of the industry on imports for its most important items of raw material. It also recommended that greater flexibility should be allowed to producers to switch over from use of high carbon chromium bars to tubes for manufacture of bearings. As mentioned in paragraph 4.1 Government have been taking action in this direction. The Advisory Panel for ball and roller bearings at its second meeting agreed that it may be assumed that races for bearings of outer diameter over 40 mm. should be standardised on tubes and those below on bars. The modern trend is to go in for the high carbon chromium steel tubes for the manufacture of races in preference to bars for the comparatively larger sizes of bearings. The new units have mostly based their production on the use of tubes. The progress made by individual units in this regard is stated below :—

10.2.1. *National Engineering Industries Ltd.*—At present it manufactures both inner and outer rings for 31 sizes from tubes, inner rings for seven sizes and outer rings for ten sizes from tubes. A few of these sizes are manufactured from both bars and tubes. It intends to switch over to use of tubes in all sizes but is unable to tool them in view of the difficulty in getting the import licence for the import of special toolings to change over to the tubes set-up.

10.2.2. *Antifriction Bearings Corporation Ltd.*—Eight sizes of ball thrust bearings and inner and outer rings for 11 sizes of cylindrical roller bearings and inner and outer rings for ten sizes of tapered roller bearings are currently manufactured from alloy steel tubes. Subject to grant of import licence it proposes to manufacture 30 more sizes of ball thrust bearings from tubes. In the case of expansion of range of manufacture of roller bearings, it prefers to use the tubes for the manufacture of rings exclusively.

10.2.3. *Bharat Ball Bearings Co. Ltd.*—At the moment it manufactures the races for 22 sizes of ball bearings from high carbon chromium steel tubes. It is further planning to switch over to the use of steel tubes in place of steel bars for making outer races of one more size.

10.2.4. *Associated Bearing Co. Ltd.*—The company uses chrome steel bars for the manufacture of inner and outer races, where outside diameter does not exceed 35 mm. For those above 35 mm. diameter, it is considered not economic to use bars owing to the considerable amount of scrap and therefore it uses chrome steel tubes for all races above 35 mm. diameter.

10.2.5. *Precision Bearings India Ltd.*—Following the practice of its collaborators, the company is making inner races from solid bars for 22 types and outer races for two types and from tubes inner races for eleven types and outer races for 29 types. It has stated that it has had no opportunity to study the substitution of bars by tubes.

10.3. In this connection, it has been suggested that the switch over to tubes from bars for races is not in keeping with the practice adopted in recent years by some foreign manufacturers, e.g., F.A.G. (Germany), S.K.F. (Austria), Koto (Japan), R & M (England) and S.K.F. (Sweden) who have given up production of races from tubes and produce these from forged bars. The principle adopted for the manufacture of rings is to feed a heated bar in a machine which first upsets it to form a sort of head. This head in the next operation is pierced to produce a ring and simultaneously the bar is positioned for the next upsetting operation. Bharat Ball Bearings Co. Ltd., Ranchi has installed one such machine in its works but has not yet adequate experience of its technical advantages or economies. The general view of the manufacturers at the inquiry was that the process had not been established as a technical advance, and that in any case could not be adopted in this country at current levels of demand and production. The large capital investment needed renders it of academic value in the context of the present position of the industry and of foreign exchange.

10.4. Rings for large diameter bearings are manufactured by a rolling process very similar to the process used for manufacturing tyres for railway wheels. National Engineering Industries Ltd. has a plan to instal a rolling machine for rings for large diameter rings.

10.5. High Carbon Chromium Steel :

10.5.1. We are informed by the Ministry of Steel & Mines that licences/letters of intent have been issued to the following manufacturers for alloy construction steel.

TABLE 13

Name	Annual capacity in tonnes	Likely date of start up (where available)
LICENSED		
Guest, Keen, Williams, Ltd., Calcutta	5,000	1967-68
Mahindra UGINE Steel Co. Ltd., Bombay	18,000	1966-67
Firth Sterling Steel Co. Ltd., Bombay	300	1965-66
N. T. Rolling Mills (P) Ltd., Bombay	5,000	
All Steel Industries Corpn. Ltd., Coimbatore	12,000	
Textile Machinery Corpn. Ltd., Calcutta	18,000	
Alloy Steel Project, Durgapur	27,000	1967-68
Mysore Iron & Steel Ltd., Bhadravati	32,000	1967-68
LETTERS OF INTENT		
1. Mahindra UGINE (Expn.)	13,000	
2. Guest, Keen, Williams Ltd. (Expn.)	51,000	
3. Birla Gwalior (P) Ltd., Calcutta.	36,000	

The Alloy Steel Project plans to expand its capacity during the Fourth Plan period. After expansion it will produce another 54,000 tonnes of constructional steels. The expansion is likely to be completed by 1970-71.

10.5.2. All the above firms will produce the primary steel and then roll it into different shapes and sizes. The exact product-mix is not known at present. Firth Sterling Steel Co. of India Ltd. has informed us that its initial plans do not include manufacture of ball bearing steel. Textile Machinery Corporation Ltd. and Birla Gwalior (Pvt.) Ltd. have also stated that they will not be producing any ball bearing steel. We understand from Guest, Keen, Williams, Ltd. that it has already produced a few tonnes of ball bearing quality steel from time to time. It has expansion schemes to raise its steel capacity from the existing level of 12,000 tonnes a year to 195,000 ingot tonnes by 1969. It proposes to manufacture about 65,000 tonnes per year of alloy and high quality carbon steels of which, according to present indications, 14,000 tonnes will be of ball and roller bearing type steel. Along with the expansion

of steel making facilities, the Company will also be installing additional rolling capacity which will enable it to supply ball and roller bearing steels as hot rolled bars. Mahindra Ugine Steel Co. Ltd. has informed us that it intends to manufacture ball bearing steel in its alloy steel plant at Khapoli (Maharashtra State) to EN 31, SAE 52100 or to any equivalent ISI standard. It expects to be able to meet the requirements of the rolling bearings industry for rolled and forged products within certain size ranges by the end of the first quarter of 1967. According to the information furnished by Hindustan Steel Ltd., its alloy Steel Project, Durgapur will be manufacturing primary steels for ball and roller bearings industry but it is not in a position at present to process its ingots further since hot working facilities are not yet fully available there. It is now producing ingots of the following sizes, namely, 7", 9", 12" and 16" and will be able to produce ingots of 20" and 22". It expects to start its rolling towards the end of the next year and when the production goes into full swing, it will produce ball bearing steels in two sizes as under :—

(1) Sections over 25 mm thickness	1,750 tonnes
(2) Rounds less than 25 mm dia.	750 tonnes
	2,500 tonnes

We understand from Mysore Iron & Steel Co. Ltd. that ball bearing steel is included in its production programme. Although its alloy steel plant is expected to be in operation by April-May 1968, it is not in a position to indicate when production of ball bearing steel will be undertaken. Mukand Iron & Steel Works Ltd., Bombay has informed us that it intends making ball bearing steel and roll it by the end of 1966. The Ministry of Iron & Steel has not yet been able to forecast the country's demand separately for each special steel item. From a report appearing in the News Bulletin of the Indian Engineering Association it appears that a delegation of the Steel Tubes Panel met the Minister of Commerce and the Minister of Industries and Supply and discussed certain points with them. One of the points made was that alloy steel tubes can be made in the country provided suitable steel is available. The information received by us in reply to our questionnaires shows that before the end of the Fourth Five Year Plan there should be enough capacity in the country for producing the required grade of primary steel and also for hot rolling bars, drawing wires and manufacturing tubes. Proper co-ordination of the efforts of various manufacturers is, however, necessary to ensure that production of all lines is properly planned and there is no wasted effort. We recommend that either the D.G.T.D. or the Ministry of Steel and Mines should make an assessment of the demand for various sections of steel required for the rolling bearings industry and co-ordinate the efforts of capable producers of rods, wires and tubes to ensure sufficient production to meet indigenous demand by the end of the Fourth Plan.

10.6. As regards tubes, the following is the capacity which will be set up in the near future :

TABLE 14

Existing manufacturer		Licence issued		Letters of intent issued	
Name	Annual capacity	Name	Annual capacity	Name	Annual capacity
	(tonnes)		(tonnes)		(tonnes)
Indian Tube Co. Ltd. Jamshedpur	30,000	1. Chimanlal Bros. Bombay	48,000	1. Director of Industries, Punjab . .	72,000
The firm is at present making only mild steel seamless tubes. It has been granted a licence for expansion by 9,600 tonnes, which may materialise by the end of 1966.		2. Textile Machinery Corporation, Calcutta . .	30,000	2. Dodsai (P) Ltd., New Delhi . .	40,000
		3. Southern Tubes Ltd., Madras	64,000	3. Zenith Steel Pipes Ltd., Bombay . .	48,000
		4. J. K. Steel Ltd., Calcutta	30,000	4. Ambica Steel Pipes Ltd. . .	40,000
			172,000	5. K. N. Misser, Kandla . .	74,000
		Sl. No. 1, for whom import licence for capital goods has been cleared, may take some time for commencing production as proposals for foreign collaboration have not yet been finalised. The other units are not likely to come into production in the near future.		6. Rannaq Singh, New Delhi . .	48,000
				7. Phatchand Aggrawala, Hissar . .	24,000
					346,000
				Sl. Nos. 2 & 3 may come into production by 1967-1968. The other firms are still at an initial stage.	

It is observed that the units mentioned above will mostly be making tubes from mild steel. Some of them may manufacture H.C.C. steel tubes, if billets are made available to them.

10.7. *High carbon chromium steel wires*.—Special Steels Ltd., Bombay has informed us that after its new annealing furnaces are installed by December 1965, it will be able to utilise 6000/7000 tonnes of installed capacity for manufacture of high carbon chromium steel wires for the rolling bearings industry from March 1966. Its licensed capacity for manufacture of steel wires is 15,000 tonnes and installed

capacity 30,000 tonnes. At present it has wire drawing machines and capacity for high carbon chromium steel wires but orders on hand for low carbon wires are heavy. It expects to produce 4500/5000 tonnes of high carbon chromium steel wire in 1966 and 6000/7000 tonnes in 1967 and onwards.

10.8. Rivetting quality steel wire is required in small quantities by the manufacturers who use rivetted cages. Typical composition of such steel is as follows:—

C.	.06 - .09 %
Si.	.02 % max.
Mn.	.3 - .5 %.
P&S.	.04 % max.

Cold drawn ; hardness about 200 Vickers.

Tensile strength 60 Kg./Sqmm.

This is a typical low carbon steel. The requirements of bearing manufacturers are rather small being a few tonnes per annum but it may be possible to locate indigenous manufacture.

10.9. *Grinding wheels*.—Precision Bearings Company has represented against the non-availability from indigenous sources of special bonded abrasives required by it. According to the D.G.T.D. there is considerable production of grinding wheels in the country and a large percentage of the requirement of the antifriction bearing manufacturers is being met out of the indigenous production. Efforts are being made by the indigenous manufacturers of grinding wheels to take on the production of special bonded grinding wheels in sizes and types required in the bearings industry through close liaison with the manufacturers of bearings. Grindwell Abrasives Ltd., Bombay, one of the manufacturers of grinding wheels, has stated that it is manufacturing most of the grinding wheels including special bonded wheels required by the bearings industry. There is a small percentage of items, namely, grinding wheels and other abrasive products in finer than 320 grit not manufactured by it as also ball lapping wheels which are an extremely hard type of abrasive wheels. These are, however, on its manufacturing programme and they are likely to be produced in two years' time. Steel and General Mills Company, Ltd., Delhi, another unit in the grinding wheels industry has stated that it will be expanding its capacity within a year or so and will be in a position to manufacture special bonded wheels for the bearings industry. Carborandum Universal Ltd., Madras, has replied that it does not have necessary equipment for manufacturing special sizes of grinding wheels required by the ball bearings industry. Its expansion programme for bonded abrasives awaiting approval of Government includes these items.

10.10. Another suggestion made by the Commission in its last Report was that encouragement should be given to the producers by way of supply of deep drawing quality m.s. strips for manufacture of

cages instead of from brass strips and bars. As mentioned in paragraph 4.1, Government have been giving encouragement to the producers to switch over to steel cages, since the country does not have adequate resources of copper and zinc. Manufacturers are also being encouraged to use cold rolled steel strips for cages through import of toolings needed for the purpose.

10.11. *Future requirements of raw materials :*

10.11.1. The quantity of raw materials required by the existing manufacturers for the year 1966 are as follows:—

TABLE 15

(In tonnes)

Types	National Engineering Industries Ltd.	Antifri- ction Bearings Corpn. Ltd.	Bharat Ball-Bearings Co. Ltd.	Associa- ted Bear- ings Co. Ltd.	Precision Bearings India Ltd.	Total
Tubes . . .	1,600	600	450	1,050	900	4,600
Bars . . .	1,500	160	440	100	550	2,750
Wires . . .	700	20	150	200	150	1,220
Strips . . .	300	80	100	260	70	810

The new units are not likely to come into full production before the middle of 1968 and small allotments for initial production alone would be necessary in their case. The total requirements of the industry may therefore be estimated as follows:

TABLE 16

(In tonnes)

	1966	1967	1968
Tubes	4,600	5,500	6,400
Bars and wires	4,000	4,500	5,000
Tools alloy steel	125	175	250
Strips	550	800	1,100
Grinding wheels	20*	25*	30*

*in lakhs of rupees

10.11.2. The value of foreign currency required would vary greatly depending upon the source of supply and may range from Rs. 2.75 crores in the case of the general currency area to Rs. 3.50 crores for the dollar area in 1966, rising to rupees four crores and rupees five crores respectively in 1968. The Ministry of Iron and Steel have under consideration the question of creating adequate indigenous capacity for these raw materials in the Fourth Plan. The importance of the matter has to be judged against the back-ground of the fact that even though the indigenous industry is meeting nearly half the demand of the country, the principal raw materials are all imported. Rolling bearings themselves are being imported at the level of rupees five to rupees six crores at present, and are likely to be imported at higher figures in the future. The production of the needed high carbon chromium steel will therefore save foreign currency of the order of rupees ten crores from 1968 onwards.

10.11.3. All the manufacturers have complained that the licences sometimes issued to them are for rupee payment countries where materials of the required grade and quality are not generally available. This is no doubt a result of the country's foreign exchange difficulties. However we recommend that while issuing licences for sources other than the G.C.A. and the Dollar area, Government should first satisfy themselves that producers will be able to secure suitable raw materials.

11.1. *Quality :*

11.1.1. In its last Report (1962) the Commission observed that while there had been some improvement in quality there was scope for further improvement. It also noted that though several steps had been taken by National Engineering Industries Ltd., to improve the quality of its products, they fell short of those necessary for a precision product. Statistical quality control had not been enforced, and effective use had not been made of electronic machines for pairing, analysis of noise level and vibration.

11. Quality and Standards.

11.1.2. The position would appear to have changed for the better with the entry into the field of new units with up-to-date machinery and testing equipment. Almost all users have agreed that there is a noticeable improvement in the quality of indigenous bearings. The main complaint is from the manufacturers of electric fans, and relates to the noise level which is of importance in that industry. Some complaints have also been made regarding occasional variance of dimensional tolerances, hardness of components, unsatisfactory assembly, and surface finish. By and large however it is agreed that the industry has taken adequate steps to maintain standards of quality with the latest techniques of production and modern equipment. Two manufacturers, Associated Bearing Company Ltd., and Bharat Ball Bearing Company Ltd., state that samples of their products are periodically sent to their principals abroad for test in their laboratories and have been reported to be as good as the foreign product.

11.1.3. The units have indicated the steps taken by them in this regard. All of them check incoming materials. All have provided operators with gauges and other checking equipment to control the quality of their own products in the course of production. These gauges and equipment are periodically tested in a central reference room or laboratory for accuracy. Assembled bearings are checked 100 per cent for dimensional requirements and visual defects. All have roving inspectors who check products at random and guide the operators where necessary. Statistical quality control systems however differ according to the practice of the collaborating firms.

11.1.4. The Advisory Panel for Rolling Contact Bearings has emphasised the need for modern design and research facilities in each undertaking, as also a central testing laboratory to ensure high standards of quality. We agree and therefore recommend that early steps should be taken in this matter.

11.2. *Standard Specifications :*

11.2.1. The Commission, in paragraph 9.5 of its last Report (1962) observed that "in view of the continued spate of complaints regarding the quality of indigenous bearings and the new products coming in the field, we would again like to emphasise the desirability of I.S.I. expediting the formulation of standard specifications. The I.S.I. has informed the Commission in connection with the present inquiry that it has published the following standards:

- (i) IS : 2399-1964 Glossary of Terms relating to rolling bearings.
- (ii) IS : 2513-1963 Boundary Dimensions for Rolling Bearings for General Engineering purposes.

It has also completed circulation of the following draft standards which are awaiting finalisation:

- (i) Identification Code for Rolling Bearings ;
- (ii) Code of practice for Installation and Maintenance of Rolling Bearings ;
- (iii) Chromium Alloy Steel Balls.

Further the following draft standards are in circulation :

- (i) Boundary Dimensions for Tapered Roller Bearings ;
- (ii) Gauging practices for Ball and Roller Bearings.

According to the I.S.I., draft standards are shortly to be put into circulation in respect of needle bearings of needle cages and needle rollers and that for dimensions for thin-walled bearings and thrust washers is said to be under preparation.

11.2.2. National Engineering Industries Ltd., has stated that it follows the British Standard Specifications in line with its U.K. collaborators while Bharat Ball Bearing Company Ltd. and Precision Bearings India Ltd. follow the AFBMA (Antifriction Bearing Manufacturers'

Association of U.S.A.) Specifications. Associated Bearing Company Ltd. follows the specifications of International Standard Organisation whereas Antifriction Bearings Corporation Ltd. follows I.S.I. specifications for ball thrust bearings and cylindrical roller bearings and the proposed International Standard Organization Specifications in the case of tapered roller bearings.

11.2.3. It has been generally accepted that National Standards should be settled both for rolling bearings and for raw materials going into them, and also that they should be on the lines of existing international standards. It is the establishment of such standards alone that will enable the industry to progress and develop satisfactorily.

12.1. *Import control policy :*

12.1.1. Rolling bearings are classified under Sl. No. 19 (Part II) of the Import Control Policy Schedule (Red Book). Imports of all types of rolling bearings and component parts thereof were canalised through the State Trading Corporation of India from the licensing period April 1963—March 1964, as against direct imports by the established importers prior to that period.

12. *Import control policy and imports.*

The same policy has been continued during the subsequent two periods, April 1964—March 1965 and April 1965—March 1966. In the case of ball bearings, licences were issued subject to both quantity and value as limiting factors. The quantity is determined by converting the value of licence at Rs. 1.43 per bearing up to 1" bore dia ; at Rs. 3.15 per bearing above 1" bore and upto 2" bore and at upto Rs. 5 per bearing above 2" bore and upto 3" bore dia. Since the licensing period April 1964—March 1965, licences are issued subject to the condition that licence holders inform the licensing authority about the progress of imports. Licences for actual users are considered on *ad hoc* basis and applications from industrial undertakings are considered for the requirements both for manufacturing purposes as well as maintenance of plant and equipment on the recommendation of the certifying/sponsoring authority. However, grant of such licences are only for the restricted sizes. Further, even these restricted sizes are allowed upto a certain percentage of certified requirements, namely 25 per cent in case of those specified in the Appendix Nos. 14(1)(b), 14(2)(b), 14(3)(a) and 14(4)(a) and 50 per cent in case of those specified in Appendix Nos. 14(1)(c), 14(2)(c), 14(3)(b) and 14(1)(a) and 3 sizes as specified in Appendix 14(2) (a) are completely banned. However, component parts of bearings not otherwise specified and not shown in Appendix 14 of the I.T.C. Schedule are allowed to be imported. Full details of the policy for the current licensing period April 1965—March 1966 are reproduced in Appendix VIII of this Report.

12.1.2. With regard to roller bearings, import licences were granted without any restriction upto the licensing period April 1964—March 1965. But during the licensing period April 1965—March 1966, the number of sizes that can be imported is restricted to 11 in cases of cylindrical roller bearings and to 10 in the case of tapered roller bearings as

specified in Appendix Nos. 14(5) and 14(6) respectively of the Red Book. Actual users are however granted licences for those specified as also not specified in the above Appendix numbers upto 50 per cent of their certified requirements. Component parts of roller bearings including accessories and of tapered/roller bearings are allowed to be imported by them.

12.1.3. The following table shows the number of sizes of rolling bearings of types restricted for import and banned completely.

TABLE 17
Number of restricted/banned sizes

Type	During the licensing period ending					
	March 1963	March 1964	March 1965	March 1966		
	Number res- tricted	Number res- tricted	Number res- tricted	Number banned	Number restricted	Number banned
Ball bearings of 1" bore and below	51	50	47	3	49	7
Ball bearings of above 1" bore and upto 2" bore	83	86	86	..	84	3
Ball bearings of above 2" bore and upto 3" bore	18	23	23	..	24	..
Ball bearings of above 3" bore	3	3	3	..	4	..
Cylindrical roller bearings	..	..	..	..	11	..
Tapered roller bearings	..	..	..	..	10	..
					182	10

12.1.4. It may be stated in this connection that while dealing with the production of bearings of size upto 76 mm. bore and even wider ranges (Non-protected) by Antifriction Bearings Corporation Ltd., and the resultant accumulation of stocks of these ranges due to liberal imports at cheaper price, the Commission in paragraph 14.4 of its last Report (1962) observed "we are however of the view that production of new varieties of bearings of good quality has to be encouraged in the interest of self-sufficiency and for conserving foreign exchange. While for lack of specific data we are unable to recommend widening of the scope of protection, we would bring this case to the notice of Government for considering sympathetically the question of regulating imports so as not to discourage such indigenous production." Accordingly, the Ministry of International Trade in its Public Notice No. 39-I.T.C. (PN/64) dated 13th May 1964 restricted the import of ball and roller bear-

ings upto a part of the certified requirements. By the same Public Notice, Appendix Nos. 14(5) and 15(6) were also added to the Red Book restricting the number of sizes to be imported in case of cylindrical roller bearings and tapered roller bearings. The policy, however, appears to be to restrict imports after substantial production is set up. This does not allow for the long period necessary to set up new lines of production which may be as much as a year or more. The reluctance of manufacturers to diversify production when existing capacity can be covered with safety by protected types is understandable. There is therefore some need to encourage the production of new sizes in advance of actual production and to get over the reluctance of the producer to undertake expensive tooling etc. Our main recommendation on the point is covered in paragraph 8.5. As regards import policy we deal with this matter in paragraph 12.2.5 below.

12.2. Imports :

12.2.1. Statistics of country-wise imports of rolling bearings during the years ended March 1963, March 1964 and March 1965 are given in Appendix IX. The total imports during these years are given below. Since the quantity of imports was maintained in terms of weight in the year ended March 1963 and in numbers in the subsequent two years as suggested by the Commission in paragraph 16.2 of its last Report (1962), it will not be possible to compare the quantity imported in 1962-63 with that in other two years. Hence an attempt is made to compare the quantity and value of imports during the years ended March 1964 and March 1965.

TABLE 18

Imports of ball and roller bearings

Specification	1963-64		1964-65	
	Quantity (Numbers)	Value (Lakh Rs.)	Quantity (Numbers)	Value (Lakh Rs.)
I. Adapter ball bearings upto 2" bore . .	167,866	8.12	148,532	9.39
Adapter ball bearings above 2" bore . .	45,652	4.83	73,895	4.47
Ball bearings upto 2" bore NES	1,655,047	79.54	2,333,437	97.71
Ball bearings above 2" bore NES	431,106	62.59	407,321	51.87
Thrust ball bearings upto 2" bore	114,643	5.82	108,181	5.42
Thrust ball bearings above 2" bore	18,552	4.05	18,685	5.13
Total of ball bearings	2,432,860	164.95	3,090,051	173.99

Specification	1963-64		1964-65	
	Quantity (Numbers)	Value (Lakh Rs.)	Quantity (Numbers)	Value (Lakh Rs.)
II. Tapered roller bearings	1,201,922	115.43	1,847,598	163.86
Roller bearings NES	483,118	105.92	670,511	137.93
Thrust type roller bearings	38,536	8.16	33,846	9.43
Total of roller bearings	1,723,576	229.51	2,551,955	311.22
III. Other bearings NES	..	..	100	0.06
Total of I, II, and III	4,156,442	394.46	5,642,106	485.27
	(Kgs.)	(Lakh Rs.)	(Kgs.)	(Lakhs Rs.)
IV. Parts of roller and ball bearings	361,681	43.10	295,146	35.64
	..	437.56	..	520.91

12.2.2. It will be seen from the above table that despite the restrictive policy adopted by Government, total imports of all types and sizes of rolling bearings in 1964-65 have increased by 36 per cent in quantity and by 23 per cent in value as compared to 1963-64. During the period under comparison total imports of ball bearings of all types and sizes have increased by 27 per cent and 6 per cent respectively in quantity and value while those of roller bearings by 48 per cent in quantity and by 36 per cent in value. In the case of parts of ball and roller bearings imports declined by 18 per cent and 17 per cent in quantity and value respectively. In terms of value the imports of protected types exceed a crore of rupees per year, even though the industry has the capacity to meet this demand.

12.2.3. At the public inquiry the producers complained against loopholes in the system of imports which were leading to competition and loss of markets. The main points made were: (i) that blanket licences lead to the import of protected types produced in the country; (ii) that classification of imported roller bearings on the basis of end use (e.g., as a spare part of agricultural machinery) leads to imports at duties below the protected rate; (iii) that sizes very near protected sizes are imported and ground to shape later for substitution in place of a protected size. We consider these objections valid, though control is obviously difficult in the case of imported varieties falling under (ii) and (iii). Nevertheless at this stage of the development of the industry, when

it is well set for a substantial advance, all assistance has to be given to it for planned development. We are, therefore, of the view that (i) blanket licences or licences with monetary limits should as far as possible contain a schedule or schedules of the sizes permitted to be imported; and (ii) that the protective rate of duty should apply uniformly no matter what the end use might be. To the extent possible sizes near the protected type should not be allowed to be imported except by a consumer and that too after a proper check on the quantities needed by him for his own use.

12.2.4. Import control policy now takes into account availability in the country. As shown in paragraph 12.1.3 ten sizes are banned altogether and imports of a further 182 sizes restricted. Further all imports are canalised through the State Trading Corporation. Nevertheless imports of sizes manufactured in the country and for which capacity is available continue. In some cases producers have stocks of some sizes equivalent to one year's demand. We consider it therefore necessary that import policy should take into account not only sizes in production but also sizes programmed to be produced. The Ball and Roller Bearings Manufacturers' Association has urged that there should be a ban or restriction of import in the following cases:

- (i) where a particular size is already in regular production with two or more manufacturers and production programmes adequately cover the demand, import should be banned;
- (ii) if a particular size is already produced by only one manufacturer and if the production programme adequately covers the demand, the import should be totally banned, provided the demand is comparatively small and existing stocks with the manufacturers are considerable;
- (iii) import of sizes of bearings for which manufacturers are carrying stocks to the extent of one year's demand or more should be totally banned;
- (iv) import of other types of bearings which are being produced should be permitted to the extent of the difference between the demand and the anticipated production programme.

12.2.5. In principle these proposals are unexceptionable (provided of course that prices and quality are acceptable) and the D.G.T.D.'s representative has informed us that policy is settled almost on these considerations. All that would appear to be necessary is for the Association to keep up-to-date information of stocks and programmes at all times and for the D.G.T.D. to take a decision regarding imports on a full consideration of all aspects. Periodical meetings between the Association, the S.T.C. and the D.G.T.D. should assist in settling import policy which would ensure that the industry's concurrent and prospective capacity is fully employed and that the consumers' needs are regularly and adequately met.

12.2.6. At present imports of rolling bearings are recorded in the "Monthly Statistics of Foreign Trade of India" under the following heads:

1. Adapter ball bearings upto 2" bore ;
2. Adapter ball bearings above 2" bore ;
3. Ball bearings upto 2" bore ;
4. Ball bearings above 2" bore ;
5. Thrust ball bearings upto 2" bore ;
6. Thrust ball bearings above 2" bore ;
7. Tapered roller bearings ;
8. Roller bearings N.E.S. ;
9. Thrust type roller bearings ;
10. Parts of ball and roller bearings ; and
11. Other bearings N.E.S.

We recommend that in future imports of each of the above types of ball and roller bearings may be recorded separately under three size-groups, namely, upto 2" (50 mm.) bore, above 2" (50 mm.) bore and upto 4" (100 mm.) bore, and above 4" (100 mm.) bore.

13.1. There are practically no exports at present. Manufacturers have stated that they have not made any exports of ball or roller bearings so far. In the published "Monthly Statistics of the Foreign Trade of India", however, certain exports and re-exports are recorded. These might have been made by the trade and are insignificant in value.

13.2. Though the country is self-sufficient in regard to a few sizes of ball bearings, the industry is entirely dependent on imports for its primary raw materials. The high cost of these imported raw materials and the small volume of indigenous production increase the cost of the indigenous bearings in comparison with the imported ones and consequently export of bearings may prove uneconomical. In any event, with large imports still being made to meet indigenous requirements, the industry will have to tackle the major problem of meeting the internal demand before addressing itself to foreign markets. The issue of exports will arise only after the country's needs are substantially met, and capacity is set up within the country for the manufacture of the main raw materials. Nevertheless, it is not too early for indigenous manufacturers to keep the prospects of export opportunity in their future plans since economies of scale of production in the not too distant future may assist in the exploitation of such markets.

14.1. The protected items of ball bearings are assessed to duty under item Nos. 72(35), 72(36) and 72(37) of the First Schedule to the Indian Tariff Act, 1934. The non-protected items of ball and roller bearings for use with shafting of more than 51 mm. bore and adapter bearings not otherwise specified are assessed to

14. Existing rates of customs duty

revenue duty under item No. 72(38). The relevant extracts from the Schedule as in operation at the time of introduction of Finance (No. 2) Bill, 1965 are reproduced below:

TABLE 19

Item No.	Name of the article	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective duty
				The U.K.	A British Colony	Burma	
1	2	3	4	5	6	7	8
<i>A. Protected Items</i>							
72(35)	Ball bearings of all kinds not exceeding 51 millimeters bore dia. adapted for use as parts and accessories of motor vehicles and motor scooters and parts thereof not otherwise specified(+)	Protective	95 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
72(36)	Ball bearings of all kinds not exceeding 51 millimeters bore diameter not otherwise specified and parts thereof.	Protective	95 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
72(37)	Adapter ball bearings not exceeding 51 mm. bore diameter not otherwise specified, which are specially designed for use exclusively with power driven machinery and parts thereof.	Protective	95 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
75(11)*	The following articles and parts thereof, adapted for use as parts and accessories of motor vehicles other than motor cycles and motor scooters, namely (+)						
(v)	The following other components : <i>roller bearings</i> , bushings (oil impregnated), panel instruments other than electrical and brake cylinders.	Protective	50 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965

1	2	3	4	5	6	7	8
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B. Non protected Item

72(38)	Ball and roller bearings for use with shaftings of more than 51 millimeters bore diameter and adapter bearings, not otherwise specified, which are specially designed for use exclusively with power driven machinery, and parts of such bearings not otherwise specified.	Revenue	10 per cent <i>ad valorem</i>	..	..	..	..
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(+) These are GATT items.

(*) Under Government of India, Ministry of Finance (Revenue Division) Notification No. 42 Customs, dated the 31st May, 1963, as subsequently amended by Ministry of Finance (Department of Revenue), Notifications No. 17-Customs dated the 1st March, 1961, No. 25-Customs, dated the 2nd February, 1963, and No. 80-Customs, dated the 1st March, 1963, articles and parts thereof adapted for use as parts and accessories of motor vehicles, other than motor cycles and motor scooters, falling under Item Nos. 71(10) and 75(11), if of the United Kingdom manufacture, are exempt from the payment of so much of that portion of the customs duty leviable thereon which is specified in the First Schedule to the Indian Tariff Act, 1934, as is in excess of the rates specified in column 2 of the schedule below :

Provided that the said articles are not also adapted for use as parts and accessories of motor cars including taxi cabs.

SCHEDULE

<i>Item No.</i>	<i>Reduced preferential rate</i>
75(10)	42½ per cent <i>ad valorem</i>
75(11)	42½ per cent <i>ad valorem</i>

NOTE : (1) The rates of customs duty shown in the above table are basic duty and are exclusive of (i) surcharge at 10 per cent of duty and (ii) regulatory duty at 10 per cent *ad valorem*.

(2) Needle roller bearings for motor vehicles, below or over 51 m.m. bore diameter, are covered by I. C. T. item No. 75(11)(v) protected item.

(3) Roller bearings below 51 m.m., not for motor vehicles are covered by the I. C. T. item 71(b)—Hardware, Ironmongery—and the rate of revenue duty is 100 per cent *ad valorem plus* surcharge of 10 per cent of duty *plus* regulatory duty of 10 per cent *ad valorem*.

(4) Imports of rolling bearings for agricultural tractors are allowed free of basic duty under Government of India, Ministry of Finance (Department of Revenue) Notification No. 2-Customs, dated 5th January 1963 as subsequently amended.

14.2. The following table shows the rates of duties as modified with effect from 20th August 1965 by the Finance (No. 2) Act, 1965.

TABLE 20

Item No.	Name of the article	Nature of duty	Stand-ard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective duty
				The U.K.	A Brit-ish Colo-ny	Burma	
1	2	3	4	5			6
A. Protected items :							
72(35)	Ball bearings of all kinds not exceeding 51 mm. bore dia. adapted for use as parts and accessories of motor vehicles (Other than motor cycles and motor scooters) and parts thereof not otherwise specified.(+)	Protec-tive	100 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
72(36)	Ball bearings of all kinds not exceeding 51 mm. bore dia. not otherwise specified and parts thereof.	Protec-tive	100 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
72(37)	Adpter ball bearings not exceeding 51 mm. bore dia. not otherwise specified, which are specially designed for use exclusively with power driven machinery and parts thereof.	Protec-tive	100 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965
*75(11)	The following articles and parts thereof, adapted for use as parts and accessories of motor vehicles other than motor cycles and motor scooters, namely: (+)						
(v)	The following other components : <i>roller becrings</i> , bushings (oil impregnated), panel instruments other than electrical and brake cylinders.	Protec-tive	60 per cent <i>ad valorem</i>	..	..	..	December 31st, 1965

1	2	3	4	5	6
B. Non-protected item:					
**72(38)	Ball and roller bearings for use with shaftings of more than 51 mm. bore dia. and adapter bearings, not otherwise specified, which are specially designed for use exclusively with power driven machinery, and parts of such bearings not otherwise specified.	Re-venue	40 per cent <i>ad valorem</i>	..	..

(+) GATT Items.

(*) Under Government of India, Ministry of Finance (Department of Revenue) Notification No. 131/F. No. Bud (No. 2) Cus. 3/65, dated 20th August 1965 articles and parts thereof adapted for use as parts and accessories of motor vehicles, other than motor cycles, motor scooters, falling under this item, if of the United Kingdom manufacture, are exempt from the payment of so much of that portion of the customs duty leviable thereon as is in excess of 52½ per cent *ad valorem*, provided that the said articles are not also adapted for use as parts and accessories of motor cars including taxi cabs.

(**)—Under Government of India, Ministry of Finance (Department of Revenue) Notification No. 119/F. No. Bud (No. 2) Cus-3/65 dated 20th August, 1965 articles, falling under this item are exempt from so much of that portion of the duty of customs duty leviable thereon as is in excess of 35 per cent *ad valorem*.

NOTES.—1. The rates of customs duty shown above are basic duty. In addition, regulatory duty at 10 per cent *ad valorem* is leviable.

2. Needle roller bearings for motor vehicles, below or over 51 mm. bore dia., are covered by I. C. T. item No. 75(11)(v).

3. Roller bearings below 51 mm., not for motor vehicles, are covered by I. C. T. item 71(b)-Hardware, ironmongery. The rate of revenue duty was 100 per cent *ad valorem* exclusive of surcharge of 10 per cent of duty and regulatory duty of 10 per cent *ad valorem*. By the Finance (No. 2) Act, 1965 the levy of surcharge has been withdrawn.

4. Imports of rolling bearings for agricultural tractors are allowed free of basic duty under Government of India, Ministry of Finance (Department of Revenue) Notification No. 2 Customs, dated 5th January 1963 as subsequently amended.

15.1. Our Cost Accounts Officers have examined the costs of production of rolling bearings manufactured by National Engineering Industries Ltd., and Antifriction Bearings Corporation Ltd., for the years ended 31st March

5. Commission's estimates of the costs of production and fair ex-works prices of rolling bearings 1965 and 31st December 1964 respectively. Besides ball bearings, NEI also produced during the costed period cycle balls, spindle inserts, axle boxes and, on an experimental scale, some roller bearings. The number of ball bearings produced was about 3.9 millions. The sizes of the bearings for which costs have been worked out represent more than 90% of all types of bearings produced by the unit. The installed capacity is of the order of 5 million bearings per annum on 3 shifts as actually worked by the

company. This unit uses both tubes and rods as raw material for the races. During the discussions it was stated by the representatives of the company that upto 25.4 m.m. bore size bearings there is some advantage by way of flexibility in using rods as the raw material. But for other sizes it was stated that though it would like to change over completely to the use of tubes in order to reduce wastages and costs it was handicapped by inability to locate raw materials of the required quality and sizes in the countries from which it is licensed to import out of foreign exchange considerations. Antifriction Bearings Corporation had been working only two shifts during the costed period. Its capacity on two shifts basis was 0.46 million of roller bearings and 0.14 million of thrust bearings. The actual production during 1964 (which was virtually the first year of production of roller bearings) was about 0.22 million roller bearings and 0.12 million thrust bearings. Besides these items it also produced steel balls used as grinding media in the paint industry. Though some rollers and cages were actually manufactured in the year 1964, in the assembled roller bearings only imported rollers and cages were used. Steel balls for thrust bearings were also imported and in future also the unit has no programme of manufacturing these steel balls. In this case costs have been worked out for almost all the items for which production was established in 1964. The records maintained by the units were not adequate enough to enable our Cost Accounts Officers to accurately compute the actual costs of production. The costs had, therefore, to be assessed as accurately as possible on the basis of available data. In the case of NEI this has been done more or less in the same manner as in the past. Since our Cost Accounts Officers' reports are confidential they are being forwarded to Government as separate enclosures.

15.2. The actual costs worked out by the Cost Accounts Officers have been discussed with the representatives of the two units. We have framed our estimates of the fair ex-works prices for the next three years on the basis of the discussions with the representatives of the two units respectively and the costs worked out by our Cost Accounts Officers. Important factors taken into consideration in framing these estimates are detailed below:—

15.2.1. *Production.*—National Engineering Industries has plans to increase the capacity of ball bearings by another 0.4 million pieces and to create additional capacity of 0.72 million pieces of roller bearings. It is expected that these expanded capacities will commence functioning early in the year 1968/69. The wastages of raw materials were found to be rather high as in the past. We have however assumed that the unit should be able to reduce the wastages to some extent compared to its past performance. This factor should therefore lead to some improvement in the output of good production. After considering all aspects of the case and the recent trends in production, we have estimated the production of all items to be manufactured by this unit separately for each of the years 1966/67, 1967/68 and 1968/69 taking into account the anticipated fall in production of cycle balls due to the estimated increase in production of ball bearings in the year 1968/69. The average estimated production for the three years comes to about 4.83

million pieces of ball bearings and 0.23 million pieces of roller bearings. In the case of Antifriction Bearings Corporation we have adopted for our future estimates the production planned by the unit for the year 1966 viz., 0.462 million pieces of roller bearings and 0.141 million pieces of thrust bearings, which is very near to the capacity of the unit. It has also been assumed in consultation with the representatives of Antifriction Bearings Corporation that in future the rollers and the cages will be manufactured by the unit and the steel balls for thrust bearings will continue to be imported. The wastages of raw materials for this unit during the costed period were somewhat lower than those of the other unit, though strict comparison is not possible as the products are different and Antifriction Bearings Corporation produces races for roller bearings entirely out of imported tubes. It expects to further improve upon this wastage factor in future and accordingly we have assumed a lower rate of wastages of raw materials in our estimates.

15.2.2. Quantities of raw materials required have been estimated on the basis of actuals taking into consideration assumed improvement in the wastage factor. Materials have been valued at the latest available rates including the effect of the Finance (No. 2) Act, 1965. In adopting the rates for imported tubes and bars the probable country of origin has also been taken into consideration. Power and fuel costs have been estimated after taking into account the latest rates of fuel and tariffs of power. In the case of National Engineering Industries provision has been made for extra costs of self-generation of electricity due to anticipated short supply of power by the State Electricity Authorities. Adequate provision has been made for normal annual increments in wages and salaries, changes in the rates of production bonus at National Engineering Industries and additional staff wherever considered necessary. Revision of wages scales at National Engineering Industries are under adjudication by a tribunal. Provision has also been made for probable increase in this behalf. The rising trends in the prices of consumable stores and repairs and maintenance materials have been provided for.

15.2.3. Depreciation including shift allowances, where applicable, has been calculated at the income-tax rates on written down values including additions either for purposes of expansion or for replacement or as balancing equipment.

15.2.4. This industry is almost entirely dependent on imported tubes and bars for raw materials. Though it is expected that adequate foreign exchange will be made available for the purpose, there is uncertainty about the country from which the purchases can ultimately be made. It is seen that the price of raw material depends on the country of origin. To provide for this and other unforeseen eventualities we have made an allowance for contingencies at 2% of the estimated costs excluding depreciation.

15.2.5. *Return.*—Taking into consideration the effect of the provisions of the Payment of Bonus Ordinance, 1965, the increase in the Bank Rates and other relevant factors, we consider that a return of 15% on the

capital employed would provide sufficient funds to meet the commitments of the industry under bonus, interest on borrowed capital, managing agents' commission, where payable, income-tax and wealth-tax, dividends on preference shares, if any, leaving a residue which would enable the units to declare a reasonable dividend on equity shares and also to provide for reasonable reserves. For this purpose, capital employed has been computed as the sum of the average net fixed assets employed and working capital assessed at 6 months' cost of production excluding depreciation.

15.3. Fair ex-works prices estimated on the above bases are exhibited in the following statement (Table 21). In the case of National Engineering Industries, the estimates for roller bearings have not been worked out, as in the costed period only negligible quantities were produced on an experimental scale only, and reliable data for purposes of estimates were not available.

15.4. The fair ex-works prices for National Engineering Industries are higher compared to those estimated during the earlier inquiry. Some of the contributory causes may be stated as under:—

- (a) Raw material prices including customs and excise duties have risen by more than 50% for steel tubes, 120% for steel bars and 150% for ball wires;
- (b) Apart from normal increases in salaries and wages, provision had to be made for increase in the production bonus rates and the likely revision of wage scales by the Tribunal;
- (c) Besides increase in the rates for fuel and power, provision had to be made for extra cost of self-generation due to uncertainty of the supply position from the State Electricity Authority;
- (d) Consumable stores and repairs and maintenance materials have become costlier;

TABLE 21

Statement showing estimated fair ex-works prices per bearing of different sizes

Sl. No.	Bearing size No.	Raw material cost	Conversion charges and depreciation	Ex-works cost (3+4)	Contingency	Return on capital employed and variable royalty	Fair ex-works price
1	2	3	4	5	6	7	8
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
(A) <i>Ball bearings (with races produced from bars)</i>							
1	110	0·501	2·257	2·758	0·048	0·584	3·390
2	112	0·585	2·325	2·910	0·051	0·613	3·574
3	115	0·726	2·396	3·122	0·055	0·646	3·823

1	2	3	4	5	6	7	8
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
4	117	1·073	2·459	3·532	0·063	0·712	4·307
5	120	1·628	2·583	4·211	0·076	0·809	5·096
6	125	2·111	2·881	4·992	0·090	0·947	6·029
7	310	0·727	2·329	3·056	0·053	0·627	3·736
8	312	0·909	2·389	3·298	0·038	0·668	4·024
9	315	1·169	2·597	3·766	0·067	0·751	4·584
10	317	1·637	2·582	4·219	0·076	0·811	5·106
11	320	2·078	2·940	5·018	0·091	0·954	6·063
12	325	3·219	3·322	6·541	0·120	1·191	7·852
13	S-3	0·217	2·575	2·792	0·047	0·621	3·460
14	S-7	0·595	2·267	2·862	0·050	0·601	3·513
15	S-8	0·879	2·438	3·317	0·058	0·676	4·051
16	S-9	1·333	2·623	3·956	0·071	0·782	4·809
17	LS-5	0·604	2·318	2·922	0·051	0·613	3·586
18	LS-7	0·951	2·414	3·355	0·060	0·681	4·106
19	LS-8	1·711	2·619	4·330	0·078	0·833	5·241
20	LS-9	1·911	2·889	4·800	0·086	0·922	5·808
21	LS-10	2·632	3·365	5·997	0·108	1·130	7·235
22	MS-8	2·270	3·111	5·381	0·097	1·016	6·494
23	MS-9	2·765	3·361	6·126	0·111	1·149	7·386
24	MS-10	3·750	3·730	7·480	0·037	1·359	8·876
25	N-1025	0·246	2·257	2·503	0·043	0·547	3·093
26	U-110	1·067	3·289	4·356	0·076	0·871	5·303
27	ULS-5	1·354	3·111	4·465	0·079	0·894	5·438
28	ULS-9	4·121	3·785	7·906	0·146	1·323	9·375
29	130	3·033	3·317	6·350	0·116	1·173	7·639
30	LS-11	3·145	3·510	6·655	0·121	1·240	8·016
31	MS-11	5·069	8·921	13·990	0·249	2·784	17·023
32	MS-12	6·685	9·503	16·188	0·291	3·102	19·581
33	U-130	6·532	9·264	15·796	0·284	2·646	18·726
34	UT-145	19·446	12·457	31·903	0·595	5·196	37·694

(B) Ball bearings (with races produced from tubes)

1	125	1·839	2·774	4·613	0·083	0·908	5·604
2	LS-9	1·730	2·782	4·512	0·081	0·890	5·483
3	MS-10	3·130	3·587	6·717	0·123	1·296	8·136
4	325	2·774	3·215	5·989	0·109	1·139	7·237
5	130	2·622	3·203	5·825	0·106	1·122	7·053
6	135	3·727	7·988	11·715	0·207	2·442	14·364
7	140	4·577	8·590	13·167	0·234	2·722	16·123
8	145	5·249	8·955	14·204	0·253	2·923	17·380
9	330	3·974	8·322	12·296	0·217	2·563	15·076
10	335	5·435	9·201	14·636	0·261	2·982	17·879

1	2	3	4	5	6	7	8
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
11	340	7.116	9.976	17.092	0.308	3.474	20.874
12	345	10.666	13.054	23.720	0.430	4.705	21.855
13	350	13.534	13.937	27.471	0.501	5.380	33.352
14	LS-12	3.456	8.152	11.608	0.204	2.407	14.219
15	MS-11	4.271	8.650	12.921	0.229	2.676	15.826
16	MS-12	5.494	9.231	14.725	0.263	2.966	17.954
17	MS-12½	7.386	9.902	17.288	0.312	3.399	20.999
18	U-130	5.987	9.036	15.023	0.270	2.566	17.859
19	U-140	10.853	12.188	23.041	0.419	4.065	27.525
20	135-ACD	8.832	10.906	19.738	0.357	3.560	23.655
21	UT-155	26.021	14.600	10.621	0.762	6.430	47.813

(C) Thrust bearings (with races produced from bars)

1	06	1.419	1.452	2.871	0.044	1.976	4.891
2	T-6	1.529	1.782	3.311	0.054	2.425	5.790
3	T-8	2.062	2.112	4.174	0.054	2.874	7.112
4	51102	0.631	0.924	1.555	0.028	1.257	2.840
5	51103	0.727	0.924	1.651	0.028	1.257	2.936
6	51104	0.887	1.122	2.009	0.034	1.527	3.570
7	51105	1.394	1.386	2.780	0.042	1.886	4.708
8	51202	0.928	1.188	2.116	0.036	1.616	3.768
9	51203	0.990	1.188	2.178	0.036	1.616	3.830
10	51204	1.295	1.518	2.813	0.046	2.065	4.924
11	51205	1.833	1.716	3.549	0.052	2.335	5.936
12	51305	2.618	2.178	4.796	0.066	2.963	7.825
13	09	1.978	1.782	3.760	0.054	2.425	6.239
14	010	2.498	2.112	4.610	0.064	2.874	7.548
15	011	2.779	2.310	5.089	0.070	3.143	8.302
16	012	3.077	2.442	5.519	0.074	3.323	8.916
17	014	4.172	3.234	7.406	0.098	4.400	11.904
18	016	4.944	3.432	8.376	0.104	4.670	13.150
19	T-12	5.992	4.026	10.018	0.122	5.478	15.618
20	T-14	8.688	4.818	13.506	0.146	6.555	20.207
21	T-16	10.718	5.412	16.130	0.164	7.364	23.658
22	51106	1.591	1.584	3.175	0.048	2.155	5.378
23	51108	2.689	1.980	4.669	0.060	2.694	7.423
24	51109	3.077	2.574	5.651	0.078	3.502	9.231
25	51110	3.651	2.838	6.489	0.086	3.861	10.436
26	51206	2.307	2.046	4.353	0.062	2.784	7.199
27	51207	3.286	2.838	6.124	0.086	3.861	10.071
28	51208	3.983	3.036	7.019	0.092	4.131	11.242
29	51210	5.602	3.498	9.100	0.106	4.759	13.965

1	2	3	4	5	6	7	8
30	51309	7.368	4.554	12.422	0.138	6.196	18.756
31	017	6.277	3.696	9.973	0.112	5.029	15.114
32	022	10.185	6.072	16.257	0.184	8.262	24.703
33	T-18	16.828	8.514	25.342	0.258	11.584	37.184
34	51113	6.832	3.828	10.660	0.116	5.208	15.984
35	51116	8.784	5.412	14.196	0.164	7.364	21.724
36	51213	10.356	5.742	16.098	0.174	7.813	24.085
37	51216	13.394	7.524	20.918	0.228	10.237	31.383

(D) *Cylindrical roller bearings*

1	N-205	1.351	7.013	8.374	0.187	1.396	9.957
2	N-206	1.846	7.400	9.246	0.197	1.474	10.917
3	N-207	2.563	8.272	10.835	0.220	1.647	12.702
4	N-208	3.214	9.277	12.491	0.247	1.847	14.585
5	N-209	3.586	10.053	13.639	0.267	2.002	15.908
6	N-210	4.050	10.892	14.942	0.290	2.169	17.401
7	N-306	2.939	8.308	11.247	0.221	1.654	13.122
8	N-307	3.743	9.105	12.848	0.242	1.813	14.903
9	N-308	4.992	10.071	15.063	0.268	2.005	17.336
10	N-309	7.630	10.936	18.566	0.291	2.178	21.035
11	N-310	9.830	12.299	22.129	0.328	2.449	24.906

(E) *Taper roller bearings*

1	30204	1.509	6.684	8.193	0.178	1.331	9.702
2	30205	1.726	7.743	9.469	0.206	1.542	11.217
3	30206	2.417	8.470	10.887	0.225	1.686	12.798
4	30209	4.808	10.644	15.452	0.283	2.119	17.854
5	30302	1.171	6.585	7.756	0.175	1.311	9.242
6	30306	3.727	9.249	12.976	0.246	1.842	15.064
7	32211	3.782	13.165	21.947	0.350	2.621	24.918
8	32212	11.605	15.122	26.727	0.402	3.011	30.140
9	32214	15.664	18.180	34.844	0.484	3.620	38.948
10	32306	5.024	10.364	15.388	0.275	2.064	17.727

(e) The estimated depreciation is inclusive of the amount calculated on the value of the additions for expansion of the bearings section. The latter amount being calculated for the first year for three shifts on the original cost including the enhanced excise duty is high.

(f) Return has been allowed at a higher rate and a margin for contingency has been allowed.

15.5. In the estimates of costs of National Engineering Industries we have made an allowance for royalty payable to the collaborators

under the old Agreement shown to us, by which it would be free of tax. We have not been shown the revised Agreement, which the firm states is a copy of the old one. Nor have we been shown any evidence that the taxes payable on the royalty are either being paid or provided for.

15.6. It may be pointed out that the fair ex-works prices have been computed purely for the purposes of arriving at the quantum of protection. They do not include selling and distribution expenses and therefore cannot be taken as the fair selling prices.

16. We obtained the c.i.f. prices from various sources which are given in Appendix X. We observed that the c.i.f. prices vary considerably for the same size of bearings from different sources. The quality, reputé or availability of the bearings may be factors responsible for such variations. We feel, however, that the quality of the bearings manufactured by the Indian companies should be comparable with those produced by their respective collaborators. Therefore, for purposes of determining the quantum of protection we have compared the fair ex-works prices of the indigenous products with the landed costs ex-duty of the corresponding products of the collaborators. Where for any item, the collaborators' c.i.f. price was not available, we have adopted the lowest c.i.f. price available. The following table (Table 23) shows the disadvantage of the indigenous products as a percentage of the c.i.f. prices. The disadvantage of the industry can be summarised as under:—

Comparison of the fair
ex-works prices with
the landed costs ex-duty

TABLE 22

	Disadvantage as a percentage on c.i.f. price
I A. Ball bearings up to 25 m.m. bore diameter	114.4
I B. Ball bearings above 25 m.m. bore diameter	215.7
Average I(A) & I(B)	141.1
II. Adapter bearings above 25 m.m. bore diameter	108.3
III A. Thrust bearing up to 25 m.m. bore diameter	122.4
III B. Thrust bearing above 25 m.m. bore and up to 50 m.m. bore	131.8
III C. Thrust bearings above 51 m.m. bore	154.9
Average of III(A), (B) and (C)	133.0
IV. Cylindrical and tapered roller bearings	126.8
Average of I to IV	137.3

TABLE 23

Statement showing the comparison of fair ex-works prices of indigenous bearings with landed costs ex-duty of corresponding imported products

Sl. No.	Bearing size No.	C.I.F. price (per piece)	Clearing charges	Landed cost ex-duty of the imported bearing (per piece)	Fair ex-works price of the indigenous bearing (per piece)	Estimated production	Difference between fair ex-works price and landed cost ex-duty (per piece)	Difference as a % on c.i.f.
1	2	3 Rs.	4 Rs.	5 Rs.	6 Rs.	7 Rs.	8 Rs.	9 %
I. BALL BEARING UP TO 25 mm. BORE (INTERNAL) DIA.								
A. (i) With races produced from bars								
1	110	1.61	0.02	1.63	3.39	4,40,120	1.76	109.3
2	112	1.64	0.02	1.66	3.57	68,340	1.91	116.5
3	115	1.75	0.03	1.78	3.82	3,25,420	2.04	116.6
4	117	1.90	0.03	1.93	4.31	10,74,060	2.38	125.3
5	120	2.26	0.03	2.29	5.10	3,15,520	2.81	124.3
6	125	2.55	0.04	2.59	6.03	72,780	3.44	134.9
7	315	2.08	0.03	2.11	4.58	17,720	2.47	118.8
8	320	2.72	0.04	2.76	6.06	23,760	3.30	121.3
9	325	3.37	0.05	3.42	7.85	1,53,640	4.43	131.5
10	S-3	1.52	0.02	1.54	3.46	32,940	1.92	126.3
11	S-7	1.87	0.03	1.90	3.51	88,560	1.61	86.1
12	S-8	2.23	0.03	2.26	4.05	2,47,790	1.79	80.3
13	LS-5	2.16	0.03	2.19	3.59	1,85,620	1.40	64.8
14	LS-7	2.34	0.04	2.38	4.11	1,37,300	1.73	73.9
15	LS-8	2.52	0.04	2.56	5.24	81,380	2.68	106.3
16	LS-9	2.69	0.04	2.73	5.81	1,230	3.08	114.5
17	LS-10	2.98	0.04	3.02	7.24	59,130	4.22	141.6
18	MS-8	2.84	0.04	2.88	6.49	5,780	3.61	127.1
19	MS-9	3.08	0.05	3.13	7.39	36,490	4.26	138.3
20	MS-10	3.75	0.06	3.81	8.88	83,110	5.07	135.2
21	ULS-9	3.80	0.06	3.86	9.38	12,940	5.52	145.4
(ii) With races produced from tubes								
22	125	2.55	0.04	2.59	5.60	61,190	3.01	118.0
23	325	3.37	0.05	3.42	7.24	96,340	3.82	113.4
Average (A)		2.15	0.03	2.18	4.64		2.46	114.4

1	2	3	4	5	6	7	8	9
<i>Ball Bearings above 25 mm. bore (Internal) Dia.</i>								
B. (i) With races produced from bars								
1	130	3.16	0.05	3.21	7.64	61,340	4.43	140.2
2	LS-11	3.98	0.06	4.04	8.02	22,210	3.98	100.0
(ii) With races Produced from tubes								
3	130	3.16	0.05	3.21	7.05	1,59,520	3.84	121.5
4	135	3.69	0.06	3.75	14.36	14,350	10.61	287.5
5	140	3.98	0.06	4.04	16.12	69,340	12.08	303.5
6	145	5.27	0.08	5.35	17.38	1,870	12.03	228.3
7	330	4.04	0.06	4.10	15.08	1,79,770	10.98	271.8
8	340	6.50	0.10	6.60	20.87	91,010	14.27	219.5
9	350	10.83	0.16	10.99	33.35	1,770	22.36	206.5
10	LS-12	4.27	0.06	4.33	14.22	1,590	9.89	231.6
11	MS-11	4.91	0.07	4.98	15.83	75,860	10.85	221.0
12	MS-12	5.97	0.09	6.06	17.95	3,160	11.89	199.2
Average (B)		4.20	0.06	4.26	13.31		9.06	215.7
Average (A and B)		2.48	0.04	2.52	6.02		3.50	141.1

II. ADAPTER BEARING ABOVE 25 mm. BORE (INTERNAL) DIA.

(i) With races produced from bars								
1	UT-145	17.91	0.27	18.18	37.69	17,690	19.51	108.9
(ii) With races produced from tubes								
2	UT-155	24.00	0.36	24.36	47.81	710	23.45	97.7
Average		18.15	0.27	18.42	38.08		19.66	108.3

III. THRUST BEARING

(A) Up to 25 mm. bore (with races produced from bars)								
1	06	2.66	0.04	2.70	4.89	1,500	2.19	82.33
2	T-6	3.33	0.05	3.38	5.79	500	2.41	72.37
3	T-8	3.94	0.06	4.00	7.11	500	3.11	78.93
4	51102	1.52	0.02	1.54	2.84	1,000	1.30	85.52
5	51103	1.62	0.02	1.64	2.94	1,000	1.30	80.25
6	51104	1.76	0.03	1.79	3.57	5,000	1.78	101.14
7	51105	1.90	0.03	1.93	4.71	3,000	2.78	146.32
8	51202	1.62	0.02	1.64	3.77	1,000	2.13	131.48
9	51203	1.76	0.03	1.79	3.83	1,000	2.04	115.91
10	51204	2.00	0.03	2.03	4.92	1,000	2.89	144.50
11	51205	2.28	0.03	2.31	5.94	5,000	3.63	159.21
12	51305	3.14	0.05	3.19	7.82	500	4.63	147.45
Average (A)		2.08	0.03	2.11	4.65		2.54	122.4

1	2	3	4	5	6	7	8	9
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(B) Above 25 mm. bore but up to 50 mm. (with races produced from bars)

1	09	3.21	0.05	3.26	6.24	4,000	2.98	92.83
2	010	3.60	0.05	3.65	7.55	1,000	3.90	108.33
3	011	4.05	0.06	4.11	8.30	1,500	4.19	103.46
4	012	4.16	0.06	4.22	8.92	1,500	4.70	112.98
5	014	4.87	0.07	4.94	11.90	3,000	6.96	142.92
6	016	6.00	0.09	6.09	13.15	1,000	7.06	117.67
7	T-12	7.47	0.11	7.58	15.62	1,000	8.04	107.63
8	T-14	9.75	0.15	9.90	20.21	1,000	10.31	105.74
9	T-16	13.00	0.20	13.20	23.66	500	10.46	80.46
10	51106	2.05	0.03	2.08	5.38	3,000	3.30	160.97
11	51108	2.86	0.04	2.90	7.42	3,000	4.52	158.04
12	51109	3.24	0.05	3.29	9.23	1,000	5.94	183.33
13	51110	3.57	0.05	3.62	10.44	1,500	6.82	191.04
14	51206	2.86	0.04	2.90	7.20	3,000	4.30	150.35
15	51207	3.43	0.05	3.48	10.07	500	6.59	192.13
16	51208	4.14	0.06	4.20	11.24	500	7.04	170.02
17	51210	5.28	0.08	5.36	13.97	1,000	8.61	163.07
18	51309	6.57	0.10	6.67	18.76	500	12.09	184.02
Average (B)		4.12	0.06	4.18	9.61		5.43	131.8

(C) Above 51 mm. (with races produced from bars)

1	017	5.53	0.08	5.61	15.11	750	9.50	171.79
2	022	9.30	0.14	9.44	24.70	250	15.26	164.09
3	T-18	18.92	0.28	19.20	37.18	500	17.98	95.03
4	51113	5.43	0.08	5.51	15.98	250	10.47	192.73
5	51116	7.19	0.11	7.30	21.72	750	14.42	200.56
6	51213	8.04	0.12	8.16	24.09	250	15.93	198.13
7	51216	10.85	0.16	11.01	31.38	250	20.37	187.74
Average (C)		9.14	0.14	9.28	23.43		14.15	154.9
Average (A, B and C)		3.59	0.05	3.64	8.41		4.77	133.0

IV (i) CYLINDRICAL ROLLER BEARINGS

1	N-206	6.14	0.09	6.23	10.92	8,000	4.69	76.38
2	N-207	7.19	0.11	7.30	12.70	23,000	5.40	75.10
3	N-208	8.19	0.12	8.31	14.59	12,500	6.28	76.68
4	N-306	7.71	0.12	7.83	13.12	17,000	5.29	68.61
5	N-307	8.85	0.13	8.98	14.90	16,000	5.92	66.89
6	N-308	10.42	0.16	10.58	17.34	11,500	6.76	64.88
7	N-309	12.23	0.18	12.41	21.04	40,000	8.63	70.56
8	N-310	14.47	0.22	14.69	24.91	10,000	10.22	70.63

1	2	3	4	5	6	7	8	9
(ii) TAPERED ROLLER BEARINGS								
1	30204	3.57	0.05	3.62	9.70	40,000	6.08	170.31
2	30205	4.05	0.06	4.11	11.22	75,000	7.11	175.56
3	30206	4.14	0.06	4.20	12.80	19,000	8.60	207.73
4	30209	6.90	0.10	7.00	17.85	63,000	10.85	157.25
5	30302	3.28	0.05	3.33	9.24	18,000	5.91	180.18
6	30306	5.05	0.08	5.13	15.06	19,000	9.93	196.63
7	32211	9.33	0.14	9.47	24.92	17,000	15.45	165.59
8	32212	11.71	0.18	11.89	30.14	42,000	18.25	155.85
9	32214	16.61	0.25	16.86	38.95	18,000	22.09	132.99
10	32306	6.90	0.10	7.00	17.73	13,000	10.73	155.51
Average for (i) & (ii)		7.57	0.11	7.68	17.28		9.60	126.8
Average I to IV		3.03	0.05	3.08	7.24		4.16	137.3

17.1. All the five producers have pleaded for continuance of protection to the industry for a further period. Besides, Bharat Ball Bearing Co. Ltd., and Antifriction Bearings Corporation Ltd., have requested that ball bearings of above 2" bore diameter should also be brought within the scheme of protection. These two units as well as Precision Bearings India Ltd., have also requested grant of protection to the entire rolling bearings industry while Associated Bearings Co. Ltd., desires protection only for tapered roller bearings upto 160 mm. outside diameter which are said to be on its manufacturing programme. The Ball and Roller Bearings Manufacturers' Association has asked for protection to all types of bearings upto 4" bore diameter or at least 3" bore diameter.

17.2. A majority of the consumers have expressed themselves in favour of grant of protection to the industry. The D.G.T.D. has stated that not only should protection to ball, ball thrust and adapter bearings upto 51 mm. bore diameter be continued but it should also be granted to cylindrical and tapered roller bearings upto 51 mm. bore diameter. According to it, protection should continue till such time as the indigenous units are put on sound footing and adequate indigenous capacity is created for the basic raw material. The Directorate does not consider it necessary to extend protection to rolling bearings above 51 mm. bore diameter, the production of which has been very small. However, with a view to providing necessary incentive for domestic production of bearings larger than 51 mm. bore diameter it has expressed the view that a higher import duty should be levied on such of the sizes as are taken up for regular production so as to bring the cost of imported bearings on par with that of the domestic products.

17.3. The statement of comparison given in paragraph 16 shows that the disadvantage of the domestic industry ranges from 108.3 per cent to 215.7 per cent. By types of bearings, the disadvantage is 141.1 per cent in ball bearings, 108.3 per cent in adapter bearings above 25 mm. bore diameter, 133.0 per cent in thrust bearings and 126.8 per cent in cylindrical and tapered roller bearings. The weighted average of these disadvantages comes to 137.3 per cent. It will thus be observed that the existing protective duty of 100 per cent on ball bearings and adapter ball bearings as well as the revenue duty on other types of bearings indicated in paragraph 14.2 above are not adequate to protect the domestic products in question. We are not, however, in favour of raising the duty to the extent indicated by the price comparison in each type as it may lead to administrative difficulties and inequitable distribution of the burden of protection among the different classes of consumers. We consider that a uniform rate of duty would be desirable and should be levied irrespective of the end use of bearings as mentioned in paragraph 12.23. Since the bulk of the domestic production is of ball bearings upto 25 mm. (the import of which is now banned) and the disadvantage suffered by which is 114.4 per cent, we consider that a protective duty of 125 per cent over the entire field should largely meet the needs of the industry. We accordingly recommend that the existing protective duty of 100 per cent *ad valorem* on ball bearings and adapter ball bearings covered by I.C.T. item Nos. 72(35), 72(36) and 72(37) should be raised to 125 per cent *ad valorem*. Further, ball bearings and adapter ball bearings of above 51 mm. bore diameter and upto and including 100 mm. bore diameter, and roller bearings upto and including 100 mm. bore diameter (but excluding railway axle-box bearings) should also be brought within the scheme of protection and subjected to the same rate of duty, namely, 125 per cent *ad valorem*. Aircraft bearings will also be outside the scheme of protection. Although the duty recommended by us is not adequate for ball bearings above 25 mm. bore dia. and thrust bearings above 51 mm. bore dia., we have taken into account the field of manufacture as a whole and the production programme given to us by the Ball and Roller Bearings Manufacturers Association, and hope that the manufacturers will progressively produce the full range of products according to the manufacturing programme submitted to us. In making the above recommendations we have taken note of the desirability to grant protection in advance for products included in the industry's manufacturing programme as mentioned in paragraph 8.5 and to give the industry the confidence with which to plan for and execute this programme.

17.4. Of the five manufacturing units, Precision Bearings India Ltd. and Associated Bearings Co. Ltd., went into production only during the current year and they will require time to stabilise their production. Further, the industry has schemes of expansion and diversification of its products. For these reasons it is necessary to provide adequate incentives to the industry. We therefore recommend that the protective duty of 125 per cent *ad valorem* mentioned above should be kept in force till 31st December 1968.

18.1. All the companies have published technical literature besides catalogues. These generally enable consumers to ensure a correct choice and use of a rolling bearing. As regards sales,

18. Selling system

National Engineering Industries Ltd., has chief dealers in three zones Calcutta, Delhi and Bombay with a number of sub-distributors. Antifric-tion Bearings Corporation Ltd., has a network of stockists in 24 important towns and one zonal distributor besides two others who may soon be appointed. Bharat Ball Bearings Co. Ltd., conducts the sales direct to original equipment manufacturers and also has stockists who sell for replacement. Associated Bearing Co. Ltd., distributes through sole selling agents, Messrs. S. K. F. Ball Bearing Co. Private Ltd. Precision Bearings India Ltd., has two sole selling agents who purchase on their own account for distribution through stockists. They also sell as agents of the Company on O.E.M. (original equipment manufacturers) accounts. It would appear, however, that technical staff for on the spot assistance and advice to consumers is a general deficiency.

18.2. *Agency sales.*—The majority of the consumers have expressed satisfaction with the present selling system though some prefer to have direct dealings with the manufacturers as in the case of Bharat Ball Bearings Co. Ltd. So long as the selling commissions do not add to the final cost unreasonably there could be no objection to the present system of sales. We are however told that in a bid for business, commission sometimes goes as high as 20 per cent with no services worth the name in return. While we would not like to be dogmatic in the matter it would appear necessary that the cost of an article which is protected with a high rate of duty should be kept as low as possible and for that reason direct sales to O.E.M. users would be in the interest of the industry as much as of the consumer.

18.3. *Selling prices.*—Since there are five manufacturers in the field fair competition should normally be expected. Some competition is now in existence. Many consumers have however, expressed the view that the prices of indigenous bearings are much higher than the landed costs of imported bearings and figures have been furnished to us which show that in some cases the prices are as much as 50 per cent higher. In its review of prices made in 1958 the Commission came to the conclusion that in the case of direct sales to the industrial consumers by National Engineering Industries Ltd., which was then the only manufacturer, the prices by and large, were well within the limits set by the price formula of the Commerce and Industry Ministry. This would appear to be true today of National Engineering Industries Ltd., but not of other producers. We would impress on the producers the need to ensure that their products are made available at reasonable ex-factory prices and that the dealers' commission truly reflects the services rendered. We have noticed in the case of a number of protected products and commodities sold in the country that an unduly large profit is made by the trade without rendering corresponding services. Such a situation should be avoided by the industry.

18.3. The selling prices of National Engineering Industries are informally controlled by the Ministry of Commerce following a practice in force for a number of years. The new units however are under no such restraint. National Engineering Industries Ltd., has contended that this has put it to undue disadvantage in that the higher retail prices and the higher sales commissions fixed by other manufacturers frequently induce N.E.I. stockists to lose interest in its products. We consider that under these conditions Government should either control the prices of all the producers or of none.

19.1. If our recommendations regarding protection to the rolling bearings industry made in paragraph 17 are accepted, the relevant items in the First Schedule to the Indian Tariff Act, 1934 should be modified as indicated in the following table and the notes thereunder:—

19. Modifications to the Indian Customs Tariff Schedule

TABLE 24

Item No.	Name of the article	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective duty
				The U.K.	A British Colony	Burma	
1	2	3	4	5			6
72(35)	Ball and roller bearings of all kinds not exceeding 100 millimetres bore diameter adapted for use as parts and accessories of motor vehicles (other than motor cycles and motor scooters) and parts thereof, not otherwise specified.	Protective	125 per cent <i>ad valorem</i>	..	..	..	December 31st, 1968
72(36)	Ball and roller bearings of all kinds (excluding railway axle-box bearings and aircraft bearings) not exceeding 100 millimetres bore diameter, not otherwise specified, and parts thereof.	Protective	125 per cent <i>ad valorem</i>	..	..	..	December 31st, 1968

1	2	3	4	5	6		
72(37)	Adapter ball bearings not exceeding 100 millimetres bore diameter, not otherwise specified, which are specially designed for use exclusively with power driven machinery and parts thereof.	Protective	125 per cent <i>ad valorem</i>	..	..	..	December 31st, 1968
72(38)	Ball and roller bearings for use with shaftings of more than 100 millimetres bore diameter and adapter bearings, not otherwise specified, which are specially designed for use exclusively with power driven machinery, and parts of such bearings, not otherwise specified.	Revenue	40 per cent <i>ad valorem</i>	..	..	..	..

(The rates of duty indicated above are exclusive of the regulatory duty of 10 per cent *ad valorem*.)

Notes :—

Item No.

- 72(35) (1) Consequential amendment to I.C.T. item No. 75(11)(v) so as to delete 'roller bearings' occurring therein is necessary.
 (2) If the roller bearings for motor vehicles are governed by the Indo-British Trade Agreement, 1939, necessary Notification specifying the preferential rate of duty should be issued.
- 72(36) } Ball and roller bearings for agricultural tractors are at present allowed free
 72(37) } of basic customs duty under Government of India, Ministry of Finance (Department of Revenue), Notification No. 2 Customs, dated 5th January 1963 as subsequently amended. We are of the view that the protective rate of duty should apply uniformly no matter what the end use might be. The extra burden on the users of agricultural machinery will be very small and uniformity in import duties will besides reducing administrative difficulties, prevent mistakes in assessment and fraud. The above Notification should therefore be amended appropriately so as to exclude ball and roller bearings of not more than 100 millimetres bore diameter.
- 72(38) Under Government of India, Ministry of Finance (Department of Revenue), Notification No. 119/F No. Bud(No. 2) cus-3/65 dated 20th August 1965 articles falling under this item are exempt from so much of that portion of the duty of customs leviable thereon as is in excess of 35 per cent *ad valorem*.

20.1. The industry uses a wide variety of types and makes of plant in the manufacturing process. Much of the machinery is of a specialised nature and some of it is designed by the bearing manufacturers themselves. The demand

20. Ancillary recommendations

for such machines is bound to be limited to requirements of their expansion programmes and replacements. Standard machines are used only in the tool room. Considering the development of the machine tool and industrial machinery industry in the country it may in due course be possible for enterprising manufacturers in the country to undertake manufacture of special machines required by the industry according to the designs of the manufacturers. This possibility may be kept in mind by the producers of industrial machinery. The industry also depends to a large extent on imports for its requirement of special tooling. Encouragement needs to be given for the establishment of units for the manufacture of specialised tools, jigs and fixtures.

21.1. Our conclusions and recommendations may be summarised as
21. Summary of conclusions and recommendations. under:—

(i) The scope of the inquiry covers the question of continuance of protection to ball and adapter bearings industry and also the question of grant of protection to other types of rolling bearings. It does not, however, include steel balls for bicycle bearings, railway axle-box bearings and aircraft bearings.

[Paragraphs 2.2 and 2.3]

(ii) Any further expansion of the rolling bearings industry would only have to be through the expansion of the five units now in production and the five others licensed to set up manufacture.

[Paragraph 5.5]

(iii) For the reasons mentioned in paragraph 6, we are doubtful of the future of the small scale sector of the rolling bearings industry. Such units as have made good progress may be given necessary assistance in all possible ways but great caution has to be exercised in allowing any expansion of such units.

[Paragraph 6.1]

(iv) Placing the consumption of rolling bearings at 14 millions in 1965, and allowing for an annual increase of about 15 per cent, the domestic demand is estimated at 16, 18.5, 21, 25, and 30 millions for the years 1966, 1967, 1968, 1969 and 1970 respectively.

[Paragraph 7.6]

(v) Since the imported raw materials account for only 15 to 30 per cent of the cost of the finished products, and these will progressively be available in the country, it is desirable to encourage the fullest manufacture of rolling bearings by providing foreign exchange for the import of raw materials to the required extent rather than import of finished products.

[Paragraph 8.5]

(vi) In-plant training facilities should be provided by all the manufacturers and cadres of designers and research workers should be built up.

[Paragraph 9.3]

(vii) Either the D.G.T.D. or the Ministry of Steel and Mines should make an assessment of the demand for various sections of steel required for the rolling bearings industry and co-ordinate the efforts of capable producers of rods, wires and tubes to ensure sufficient production to meet the indigenous demand by the end of the Fourth Five Year Plan.

[Paragraph 10.5.2]

(viii) While issuing licences for raw materials for the rolling bearings industry for sources other than the General Currency Area and the Dollar Area, Government should first satisfy themselves that producers will be able to secure suitable raw materials from these sources.

[Paragraph 10.11.3]

(ix) Early steps should be taken to establish modern design and research facilities in each undertaking as also a central testing laboratory to ensure high standards of quality.

[Paragraph 11.1.4]

(x) Blanket licences or licences with monetary limits should as far as possible contain a schedule or schedules of the sizes of bearings permitted to be imported and the protective rate of duty should apply uniformly no matter what the end use might be. To the extent possible sizes near the protected type should not be allowed to be imported except by a consumer and that too after a proper check on the quantities needed by him for his own use.

[Paragraph 12.2.3]

(xi) Periodical meetings between the Ball and Roller Bearings Manufacturers' Association, the S.T.C. and the D.G.T.D. should assist in settling import policy which would ensure that the industry's concurrent and prospective capacity is fully employed and that the consumers' needs are regularly and adequately met.

[Paragraph 12.2.5]

(xii) Future imports of ball and roller bearings should be recorded in the "Monthly Statistics of the Foreign Trade of India" on the lines indicated in paragraph 12.2.6.

[Paragraph 12.2.6]

(xiii) Protection granted to ball bearings and adapter ball bearings, not exceeding 51 mm. bore diameter, covered by I.C.T. Item Nos. 72(35), 72(36) and 72(37) should be continued for a further period of three years ending 31st December 1968 but the protective rate of duty should be raised to 125 per cent *ad valorem*. Further, ball bearings and adapter ball bearings of more than 51 mm. bore diameter and upto and including 100 mm. bore diameter and roller bearings upto and including 100 mm. bore diameter (excluding railway axle box bearings) should be brought within the scheme of protection and subjected to

the same rate of duty, namely, 125 per cent *ad valorem*. This duty also should remain in force till 31st December 1968. Aircraft bearings will also be outside the scheme of protection.

[Paragraphs 17.3 and 17.4]

(xiv) Government should either control the selling prices of all the manufacturers of rolling bearings or of none.

[Paragraph 18.3]

(xv) If the recommendations regarding protection are accepted by Government, the relevant items of the First Schedule to the Indian Tariff Act, 1934 should be amended as indicated in paragraph 19.

[Paragraph 19]

(xvi) Encouragement needs to be given for the establishment of units for the manufacture of specialised tools, jigs and fixtures required by the rolling bearings industry.

[Paragraph 20]

22. We wish to express our thanks to the manufacturers, importers and consumers as well as various Government Departments for their co-operation in conducting this inquiry.

Acknowledgments



M. P. PAI,
Chairman.

B. G. GHATE,
Member.

M. ZAHEER,
Member.

K. T. MERCHANT,
Member.

PRAMOD SINGH,
Secretary.

BOMBAY:

Dated 30th September, 1965.

APPENDIX I

(Vide paragraph 3.1)

List of parties to whom the Commission's questionnaires/letters were issued and from whom replies or memoranda have been received.

*Indicates those who have replied or sent memoranda.

@Indicates those who are not interested.

A. PRODUCERS :

- *1. National Engineering Industries Ltd. (Bearing Division), Jaipur (Rajasthan).
- *2. The Antifriction Bearings Corporation Ltd., Bhangar Wadi, Lonavla.
- *3. Associated Bearings Co. Ltd., Mahatma Gandhi Memorial Bldg., Netaji Subhash Road, Bombay-1.
- *4. Bharat Ball Bearing Co. Ltd., 49/1, Gariahat Road, Calcutta-19.
5. Hindusthan Ball Bearing Co. Ltd., Chandrasekhar Bhavan, Agra.
6. New Commercial Bearings Corporation Ltd., Railwaypura Post, Ahmedabad.
7. Union Bearing Mfg. Co., Porbandar.
- *8. Precision Bearings India Ltd., Wavel House, 15, Graham Road, Ballard Estate, Bombay.

B. SMALL SCALE PRODUCERS :

1. Metal Perforation (P) Ltd., 177/1, Dum Dum Road, Calcutta-28.
- *2. Babu & Co., Gheekanta Road, Ahmedabad.
- *3. Gupta Auto Products, Match Factory Road, Kurla, Bombay-70.
- *4. Scientific Machanic Works, Tramway Road, Gujarat.

C. PRODUCERS OF SINTERED BEARINGS :

- *1. Simetalls Pvt. Ltd., 61, Government Gate Road, Bombay-12.
- *2. Mahindra Sintered Products Ltd., Pimpri, Poona.
3. Flexicons Ltd., Advani Chambers, Bombay.

D. PROSPECTIVE PRODUCERS :

- *1. C. Z. Roller Chains (India), Akash Deep, French Bridge Sandhurst Road, Bombay-7.
- @2. Ex-Celle India Ltd., 78-B, A. Besant Road, Bombay-18.
3. P. S. Ball Bearing Co. Ltd., 7A, Rajpur Road, Delhi-8.
- *4. New Haven Steel Ball Corpn. P. Ltd., Pandyan House, 309, Frere Road, Bombay-1.
5. Coimbatore Pioneer Engg. Co. Ltd., 2, Pioneer Mills Road, Pilamedu, Coimbatore-4.
- *6. Indo-Nippon Precision Bearing Ltd., 5-10-178, Fateh Maidan Road, Hyderabad.

E. PRODUCERS' ASSOCIATION :

The President, Ball and Roller Bearing Manufacturers' Association of India, 49/1, Gariahat Road, Calcutta-19.

F. IMPORTERS :

- *1. The Central Trading Co., Canning Street, Calcutta-1.
2. Greaves Cotton & Co. Ltd., 1, Forbes Street, Fort, Bombay.
3. Joshina & Thakker Engineering Stores, Tulsi Falia, Station Road, Surat.
4. Roberts Mclean & Co. Ltd., 31, Netaji Subhas Road, Calcutta-1.
- *5. Mcleod & Co. Ltd., Netaji Subhas Road, Calcutta-1.
- *6. S. K. F. Ball Bearing Co. Ltd., Mustafa Building, 19, Sir P. M. Road, Fort, Bombay-1.
7. P. B. Shah & Co. Ltd., 34, Netaji Subhas Road, Calcutta.
8. C. C. Vaswani & Co., 11, Habib Court, Causeway, Bombay.
9. William Jacks and Co. Ltd., 16, Netaji Subhas Road, Calcutta-1.
10. Dhirajlal & Co., 15, New Queen's Road, Bombay-4.
- *11. Kamlashankar P. Joshi Co., 98, Nagdevi Cross Lane, Bombay-3.
12. United Supply Agency Pvt. Ltd., 38, Strand Road, P. B. No. G.P.O. 865, Calcutta-1.
13. Calcutta Cycle Supply Co., 11-A, Lall Bazar Street, Calcutta-1.
14. Nariendarnath D. Puri, Mistry House, 25, Parsi Bazar Street, Bombay.
15. Dhirajlal Morarji, 37-A, Sarang Street (Khokha Bazar), Bombay-3.
16. Rajkumar & Co., 157-59, N. Dhuru St., Bombay-3.
17. Machine Tools & Implements, 93-95, N. Dhuru St., Bombay-3.
18. Bearing Sales Corpn., 289/91, Nagdevi St., Bombay-3.
19. Associated India Agencies, Indian Exchange Bldg., Calcutta-1.
- *20. The State Trading Corpn. of India, P. B. No. 79, New Delhi.
21. Hazarat & Co., Wardon House, Sir P. Mehta Road, Bombay-1.
22. New Haven Steel Ball Corpn. (P) Ltd., Pandyan House, 309, Frere Road, Bombay-1.
23. Harkishanlal & Co., 2153, Tilak Bazar, Delhi-6.
24. Tropical Traders (P) Ltd., Atlas Mills Compound, Reay Road, Bombay-10.
25. United Engg. Eastern Corpn., 22, Canning Street, Calcutta-1.
- *26. J. Stone & Co. India (P) Ltd., 16, Taratalla Road, Calcutta-1.
27. William Jacks & Co. Ltd., 16, N. S. Road, Calcutta.
28. Alcock Ashdown & Co. Ltd., 16, Bank Street, Fort, Bombay-1.
- *29. International Trade Links, Handloom House Annexe, Dr. Dadabhoi Naoroji Road, Bombay-1.

G. IMPORTERS' ASSOCIATIONS :

1. The Mill Gin Stores Merchants' Association, 88/92, Nagdevi Street, Bombay-3.
- *2. Bharat Chamber of Commerce, Imperial Bank Building, Calcutta.
- *3. The All India Ball Bearing Merchants' Association, 524, Sandhurst Road, Sandhurst Building, Bombay-4.

H. CONSUMERS :

1. Hind Cycles Ltd., 250, Worli, Bombay-18.
2. T. I. Cycles of India, Ambattur, Near Madras.
- *3. Crompton Parkinson (Works) Ltd., Haines Road, Worli, Bombay-18.
4. Jaura Engineering Works, Azad Nagar, Amritsar.
5. Alcock Ashdown & Co., Defence Works, Mazgaon, Bombay.
- *6. Associated Electrical Industries Mfg. Co. Ltd., Crown House, 6, Mission Row, Calcutta-1.

- *7. British India Electric Construction Co. Ltd., 6, Mayurbhanj Road, Calcutta-23.
- *8. Kirloskar Electric Co. Ltd., Post Box No. 1017, Bangalore-3.
- 9. Praga Tools Corporation Ltd., Saifabad, Hyderabad (Andhra Pradesh).
- 10. S. P. Engineering Corporation, 79/7, Latouche Road, Kanpur.
- *11. Jyoti Ltd., Post: Chemical Industries, Baroda-3.
- *12. Kirloskar Brothers Ltd., Kirloskarvadi, South Satara District.
- 13. Port Engineering Works Ltd., 8, Clive Row, Calcutta-1.
- *14. Tata Iron and Steel Co. Ltd., Bombay House, Bruce Street, Fort, Bombay.
- 15. Vasant Industrial & Engineering Works, 'Vasant Vijay', 470-471, Worli, Bombay-18.
- 16. Hindustan Motors Ltd., 8, Royal Exchange Place, Calcutta.
- *17. Simpson & Co. Ltd., 202/203, Mount Road, Madras.
- *18. Maharashtra State Road Transport Corporation, Central Stores, S. T. Premises, Bellasis Road, Bombay-8.
- *19. B.E.S.T. Undertaking, Electric House, Bombay.
- *20. Air India International, Santa Cruz, Bombay-29.
- 21. Controller of Stores, Northern Railway, The Mall, Delhi.
- 22. Controller of Stores, Southern Railway, Perambur, Madras.
- 23. Controller of Stores, Western Railway, Churchgate, Bombay.
- *24. Bombay Port Trust, Ballard Estate, Bombay.
- 25. Calcutta Fan Works Ltd., 19-B, Chowringhee Road, Calcutta-13.
- 26. Stores and Purchase Officer, Machinery Manufacturers' Corporation Ltd., P-618, Circular Garden, Reach Road, Calcutta-23.
- *27. National Machinery Manufacturers Ltd., Kalwa, Thana.
- 28. Parmar Mechanic Works, Vadi Pura, Surendranagar (Saurashtra).
- 29. Sewing Machine Parts Making Works, Surendranagar (Saurashtra).
- 30. Central India Machinery Manufacturers Ltd., P. B. Birlanagar, Gwalior.
- 31. Textile Machinery Corporation Ltd., Belgharia.
- *32. Textool Company Ltd., Post Box No. 221, Ganapathy, P.O., Coimbatore-6.
- 33. Textile Equipment Co., 11-A, Sitalfalwadi, Mount Road, Mazgaon, Bombay-10.
- 34. Ravi Industries Ltd., Nawapada, Bombay Agra Road, Thana.
- 35. Indo-Engineering Works, Dr. Annie Besant Road, Opp. Gwalior Place, Worli, Bombay-18.
- *36. Hindustan Textile Engineers, Janma Bhoomi Bhavan, 3rd Floor, Ghoga St., Fort, Bombay-1.
- *37. The Tata Engineering & Locomotive Co. Ltd. (Automobile Division), Bombay House, Bruce Street, Bombay-1.
- *38. Mahindra & Mahindra Ltd., Gateway Building, Apollo Bunder, Bombay-1.
- *39. The Standard Motor Products of India Ltd., 29, Mount Road, Madras-6.
- *40. The Automobile Products of India Ltd., Agra Road, Bhandup, Bombay.
- 41. The Controller of Stores, Central Railway, V.T., Bombay.
- 42. The Indian Sugar & General Engineering Corp'n. Ltd., Yamuna Nagar, (P.O.), Distt. Ambala.
- 43. National Electrical Industries, Industrial Estate, Lalbaug, Bombay-12.

- *44. Jay Engineering Works Ltd. (Usha Fans), 183-A, Prince Anwar Shah, Dhakuria, Calcutta-31.
- *45. India Electric Works Ltd., Diamond Harbour Road, Calcutta-34.
- *46. The General Electric Co. of India (Mfg.) Ltd., 68, Taratalla Road, Garden Reach, Calcutta-24.
- 47. P. S. G. & Sons, Charity Industrial Institute, Peelamedu P.O., Coimbatore.
- 48. Clyde Fan Company Private Ltd., Rai Bahadur Road, Behala, Calcutta-34.
- *49. Bharat Electrical Industries Ltd., 19, Rajendranath Mookerjee Road, Calcutta-1.
- 50. Motor & Machinery Manufacturers Ltd., 31, Chittaranjan Avenue, Calcutta-12.
- *51. Bharat Bijlee Ltd., Udyognagar, Bombay-22.
- *52. Godrej & Boyce Mfg. Co. (P) Ltd., Lal Baug, Parel, Bombay.
- 53. Khira Steel Works (P) Ltd., Ghodbunder Road, Santacruz, Bombay-54.
- 54. Heavy Electricals Ltd., Bhopal.
- *55. Premier Automobiles Ltd., Agra Road, Kurla, Bombay.
- 56. W. H. Brady & Co. Ltd., Brady House, Bombay-1.
- 57. Dunlop Rubber Co. (India) Ltd., 57-B, Free School Street, P. B. No. 391, Calcutta-16.
- 58. Firestone Tyre and Rubber Co. of India (P) Ltd., Haybunder Road, P. B. No. 197, Bombay-1.
- 59. Good Year Tyre and Rubber Co. India Ltd., Swadeshi Mill Estate, Tata Road No. 2, Bombay-4.
- 60. Diesel Locomotives Works, Varanasi.
- *61. Hindustan Machine Tools, Bangalore-13.
- 62. Hindustan Machine Tools, Alwaye (Kerala).
- 63. Hindustan Machine Tools, Hyderabad.
- 64. Larsen and Toubro Ltd. (Tractor Division), I. G. House, Dougali Rd., Bombay-1.
- 65. Amalgamations Ltd. (Tractor Division), C/o Simpson and Co., Mount Rd., Madras.
- 66. Association of India Automobile Manufacturers, Army & Navy Building, M. G. Road, Bombay-1.
- 67. Association of Indian Industries, Co-operative Insurance Bldg., P. M. Road, Bombay-1.
- *68. G.T.R. Co. (P) Ltd., 37, Dum Dum Road, Calcutta-30.
- 69. The International Tractor Co. of India Ltd., Gateway Bldg., Apollo Bldg., Bombay-1.
- 70. Hindustan Heavy Machinery Corp'n. Ltd., Ranchi.
- 71. Atlas Engg. Industries, Batala (Punjab).
- 72. Mysore Kirloskar Ltd., Harihar (Mysore State).
- *73. Cooper Engg. Ltd., Satara Road, Satara District.
- 74. Oriental General Industries Ltd., 14, Radha Bazar Lane, Calcutta-1.
- 75. Engineering Works of India Ltd., 20, Ultadanga Road, Calcutta-4.
- 76. Clyde Fan Co. (P) Ltd., Rai Bahadur Road, P.O. Bahala, Calcutta.
- 77. Rampur Engg. Co. Ltd., 69, Civil Lines, Rampur (U.P.).
- 78. Central India Electric Works, 25, Jawahar Nagar, Delhi.
- @79. Acme Mfg. Co. Ltd., Construction House, Ballard Estate, Fort, Bombay.
- 80. Gandhi Electric Industries (P) Ltd., 91, Medows Street, Bombay-1.

81. Ditz Electricals (I) Ltd., 29, Malkaganj Road, Subzimandi, Delhi.
- *82. Matchwell Electricals India Ltd., P.O. Yaravda, Poona.
83. J. Stone and Co. (India) P. Ltd., Alipore, Calcutta-27.
84. Beni Ltd., 1, Crooked Lane, Calcutta.
85. Rallifan Ltd., Ralli House, 21, Ravellin Street, Fort, Bombay-1.
86. Jaira Engg. Works, Chandigarh.
87. Naranlala Metal Works, Near Railway Station, Navsari, W. Railway.
88. Metropole Sound Products, Amritsar.
89. Polar Electric Fan Marketing Co., 168-B, Cotton Street, Calcutta-7.
90. Universal Engg. Works, Amritsar.
91. Ashok-Leyland Ltd., 38, Mount Road, Madras-6.
92. Simpson & Co. Ltd., Mount Road, Madras-2.
93. Chittaranjan Locomotive Works, P.O. Chittaranjan (Burdwan Dt.).
94. Jamshedpur Engineering & Machine Mfg. Co., P.O. Telco Works, Via Tatanagar.
95. Arthur Butler and Co. (Muzafferpore) Ltd., Muzaffarpur, Bihar.
- @96. Kamani Engineering Corporation Ltd., Kamani Chambers, Nical Road, Ballard Estate, Bombay.
- @97. The Modern Machines Ltd., Paharganj, New Delhi.
98. The Gwalior Engineering Works, Kampee Lashkar, Gwalior.
99. Argus Engineering Co. Ltd., Warden House, Sir P. M. Road, Bombay-1.
100. Parry and Co. Ltd., Dare House, Madras-1.
101. Hindustan Aircraft Ltd., Bangalore.
102. Bengal Ingot Co. Ltd., 5, Hide Road, Kidderpore, Calcutta.
103. Port Engineering Works, Nazirgunge, Howrah.
104. Gresham and Craven of India Ltd., 22, Gobra Road, Entally, Calcutta.
105. Braithwaite and Co. (India) Ltd., Clive Works, Hide Road, Kidderpore, Calcutta.
106. Burn and Co. Ltd., Howrah.
107. Ganges Galvanizing Works (India) Ltd., 14 & 14/1, Kissen Dayal Jalan Road, Salkia, Howrah.
- *108. The Indian Standard Wagon Co. Ltd., Santa Works, Burnpur (Dist. Burdwan).
- @109. Robert Hudson (India) Ltd., Satya Doctors Road, P.O. Kidderpore, 24 Parganas.
110. Howrah Trading Co. Ltd., 62/D/2, J. N. Mukherjee Road, Ghosury, Howrah.
111. Saxby & Farmer (India) Pvt. Ltd., 17, Convent Road, Entally, Calcutta-14.
112. Jessop & Co. Ltd., 63, Netaji Subhas Road, Calcutta.
113. D. K. Das & Co. Ltd., (Bantra Engineering Works), 233, Balilios Road, Howrah.
114. The Pioneer Iron and Steel Corporation, 68, Nalini Seth Road, Calcutta.
115. Integral Coach Factory, Perambur, Madras.
- *116. The General Manager, Southern Railway, Madras-1.
117. The General Manager, Northern Railway, Baroda House, New Delhi.
118. The General Manager, North Eastern Railway, Gorakhpur.
119. The General Manager, Eastern Railway, Fairle Place, Calcutta.
120. The General Manager, South Eastern Railway, Garden Reach, Calcutta.

I. CONSUMERS' ASSOCIATIONS :

- *1. The Secretary, Fan Makers' Association of India, India Exchange, India Exchange Place, Calcutta-1.
- *2. The Secretary, Indian Electrical Manufacturers Association, India Exchange, Calcutta.
- *3. The Secretary, Engineering Association of India, 23, Netaji Subhas Road, Calcutta.
- 4. Delhi Motor Traders' Association, P.O. Box No. 1098, Kashmere Gate, Delhi-1.
- *5. Indian Pump Mfrs.' Association, India Exchange, India Exchange Place, Calcutta-1.

J. DEALERS :

- 1. Associated India Agencies, India Exchange Building, Calcutta-1.
- 2. Motor Trade Supply Co., Parekh Mansions, Sardar Patel Road, Bombay-4.
- *3. Babu & Co., Gheekanta Road, Ahmedabad.

K. RAW MATERIAL SUPPLIERS :

- 1. The Superintendent, Metal & Steel Factory, Ichapur-Nawabgunj (West Bengal).
- *2. Mukund Iron & Steel Works Ltd., Bombay Agra Road, Kurla, Bombay-70.
- 3. Bharatia Electric Steel Co. Ltd., 8, Sminhoe Street, Ballygunge, Calcutta-19.
- 4. Man Industrial Corporation Ltd., P.O. Box No. 131, Jaipur (H.O.).
- 5. T. I. & M. Sales Pvt. Ltd., 2nd Floor, United Bank of India Bldg., Sir P. M. Road, G.P.O. Box No. 1308, Bombay-1.
- @6. Devidayal Rolling & Refineries Pvt. Ltd., Tulsiram Gupta Mills Estate, Darukhana, Bombay-10.
- *7. Birla Gwalior (P) Ltd., Gwalior.
- *8. Special Steel Ltd., Village Moujae, Dattapara Road, Bombay-16.
- 9. Carborundum Universal Ltd., Madras-1.
- *10. Grindwell Abrasives Ltd., Bombay-1.
- 11. General Abrasive Co. Pvt. Ltd., Bombay.
- *12. Steel and General Mills Co. Ltd., Delhi-8.
- 13. Thermal Products Co., Bombay-20.
- 14. Krishnalal Thirani & Co., Calcutta-1.

L. GOVERNMENT DEPARTMENTS :**(i) CENTRAL GOVERNMENT**

- *1. The Director of Co-ordination and Statistics, Directorate General of Supplies and Disposals, National Insurance Building, Parliament Street, New Delhi.
- *2. The Chief Controller of Imports & Exports, Ministry of Commerce, Government of India, New Delhi.
- *3. The Iron and Steel Controller, 33, Netaji Subhas Road, Calcutta.
- *4. The Director, Indian Standards Institution, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi-1.
- *5. The Director General of Technical Development, Udyog Bhavan, Maulana Azad Road, New Delhi.
- *6. The Development Commissioner, Small Scale Industries, Ministry of Industry & Supply, Udyog Bhavan, Maulana Azad Road, New Delhi.

- *7. The Secretary to the Government of India, Ministry of Steel and Mines, Department of Steel, New Delhi.
- *8. Secretary, Planning Commission, New Delhi.
- *9. The Secretary, National Industrial Development Corporation, New Delhi.
- 10. The Secretary, Railway Board, Railway Bhavan, New Delhi.
- *11. The Deputy Director (Co-ordination), Directorate General of Industry and Supply, Udyog Bhavan, New Delhi.
- *12. The Collector of Customs, Bombay.
- *13. The Collector of Customs, Calcutta.
- *14. The Collector of Customs, Madras.
- *15. The Collector of Customs, Cochin.

(ii) STATE GOVERNMENTS

- *1. The Chief Secretary to the Government of Andhra Pradesh, Hyderabad.
- *2. The Chief Secretary to the Government of Assam, Shillong.
- 3. The Chief Secretary to the Government of Bihar, Patna.
- *4. The Chief Secretary to the Government of West Bengal, Calcutta.
- 5. The Chief Secretary to the Government of Gujarat, Ahmedabad.
- 6. The Chief Secretary to the Government of Jammu and Kashmir, Srinagar.
- *7. The Chief Secretary to the Government of Kerala, Trivandrum.
- *8. The Chief Secretary to the Government of Madhya Pradesh, Bhopal.
- *9. The Chief Secretary to the Government of Madras, Madras.
- *10. The Chief Secretary to the Government of Maharashtra, Bombay.
- *11. The Chief Secretary to the Government of Mysore, Bangalore.
- *12. The Chief Secretary to the Government of Orissa, Bhubaneswar.
- 13. The Chief Secretary to the Government of Punjab, Chandigarh.
- 14. The Chief Secretary to the Government of Rajasthan, Jaipur.
- 15. The Chief Secretary to the Government of Uttar Pradesh, Lucknow.
- *16. The Chief Commissioner, Delhi Administration, Delhi.
- *17. The Chief Commissioner, Himachal Pradesh, Simla.
- *18. The Director of Industries, Government of Andhra Pradesh, Hyderabad.
- *19. The Director of Industries, Government of Assam, Shillong.
- 20. The Director of Industries, Government of Bihar, Patna.
- *21. The Director of Industries, Government of West Bengal, Calcutta.
- 22. The Director of Industries, Government of Gujarat, Ahmedabad.
- 23. The Director of Industries, Government of Jammu and Kashmir, Srinagar.
- *24. The Director of Industries, Government of Kerala, Trivandrum.
- *25. The Director of Industries, Government of Madhya Pradesh, Bhopal.
- *26. The Director of Industries, Government of Madras, Madras.
- 27. The Director of Industries, Government of Maharashtra, Bombay.
- *28. The Director of Industries, Government of Mysore, Bangalore.
- *29. The Director of Industries, Government of Orissa, Bhubaneswar.
- @30. The Director of Industries, Government of Punjab, Chandigarh.
- 31. The Director of Industries, Government of Rajasthan, Jaipur.
- *32. The Director of Industries, Government of Uttar Pradesh, Lucknow.
- 33. The Director of Industries, Delhi Administration, Delhi.
- 34. The Director of Industries, Government of Himachal Pradesh, Simla.

APPENDIX II

(Vide Paragraph 3.2)

List of factories visited by the Commission and its Officers.

Name of the factory	By whom visited	Date of visit
1. National Engineering Industries Ltd., Jaipur.	(1) Shri M. P. Pai Chairman (2) Shri N. Das Technical Director (E & M). (3) Shri A. K. Banerji Cost Accounts Officer.	6-8-1965 12-12-1964 13-7-1965 to 21-7-1965
2. Antifriction Bearing Corporation Ltd., Lonavala.	(1) Shri N. Das Technical Director (E & M). (2) Shri A. K. Ganguli Asstt. Cost Accounts Officer.	2-10-1964 25-6-1965 to 2-7-1965
3. Associated Bearing Co. Ltd., Chinchwad, Poona Dt.	(1) Shri M. P. Pai Chairman (2) Dr. B. G. Ghate Member (3) Shri M. Zaheer Member (4) Shri Pramod Singh Secretary. (5) Shri S. K. Basu Senior Cost Accounts Officer (6) Dr. P. V. Gunishastrri Director (R & R). (7) Shri N. Das Technical Director (E & M).	 } 27-7-1965 } 1-10-1964 } 29-1-1965 } 27-7-1965
4. Precision Bearings India Ltd., Baroda.	Shri N. Das Technical Director (E & M).	8-12-1964
5. Mukand Iron and Steel Works Ltd., Kurla, Bombay.	Shri N. Das Technical Director (E & M).	2-9-1965

APPENDIX III

(Vide Paragraph 3.3)

List of persons who attended the Commission's Public inquiry on 24th August 1965

A. PRODUCERS

1.	Shri J. D. Thirani	Representing	National Engineering Industries Ltd., Jaipur (Rajasthan).
2.	„ V. N. Dhurka		
3.	„ V. R. Kodia		
4.	„ B. K. Maheshwari		
5.	„ D. Shah		
6.	„ T. M. Desai		
7.	„ N. J. Mehta	„	The Antifriction Bearings Corporation Ltd., Bhangarwadi Road, Lonavla.
8.	„ A. K. Roy Chowdhury		
9.	„ Balakrishnan		
10.	„ P. Rajagopal		
11.	„ Lala Shri Dhar	„	Bharat Ball Bearing Co. Ltd., 49/1 Gariahat Road, Calcutta-19.
12.	„ R. Dayal		
13.	„ S. G. Chowdhary		
14.	„ Krishan Chand	„	Bharat Ball Bearing Co. and The Ball and Roller Bearing Manufacturers' Association of India, 49/1, Gariahat Road, Calcutta.
15.	„ M. K. Joshi	„	Precision Bearings India Ltd., Wavel House, 15, Graham Road, Ballard Estate, Bombay-1.
16.	„ Y. N. Gupta		
17.	„ C. D. Alexander		
18.	„ J. H. Horner	„	Associated Bearing Co. Ltd. Mahatma Gandhi Memorial Building, Netaji Subhash Road, Bombay-1.
19.	„ P. C. Chhabra		
20.	„ T. Mathews		

B. SMALL-SCALE PRODUCERS

21.	Shri Babubhai S. Panchal	„	Babu & Co., Ahmedabad.
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C. PROSPECTIVE PRODUCERS

22.	Shri M. D. Mehta	„	New Haven Steel Ball Corporation P. Ltd., Parliyan House, 309, Frere Road, Bombay-1.
23.	„ M. Joshi	„	Indo-Nippon Precision Bearing Ltd., 5-10-178, Fateh Maidan Road, Hyderabad (A.P.).

D. IMPORTERS

24. Shri Narayan Menon	}	.	.	.	.	Representing International Trade Links, Handloom House Annexe, Dr. D. N. Road, Bombay-1.
25. „ S. L. Khanna						
26. „ H. T. Mirchandani	.	.	.	.	„	S. K. F. Ball Bearing Co. Ltd., Mustafa Bldg., 19, Sir P. M. Road, Bombay-1.
27. „ D. S. Gandhi	.	.	.	.	„	Dhirajlal & Co., 15, New Queen's Road, Bombay-4.
28. „ G. C. Mirchandani	.	.	.	.	„	McLeod & Co. Ltd., Netaji Subhash Road, Bombay.
29. „ C. M. Parikh	.	.	.	.	„	The East Asiatic Co. (India) P. Ltd., Ballard Estate, Bombay-1.
30. „ N. K. Joshi	.	.	.	.	„	Kamalashankar P. Joshi & Co., 98, Nagdevi Cross Lane, Bombay.
31. „ R. L. Maheshwari	.	.	.	.	„	Central Trading Co., 137, Canning Street, Calcutta-1 and Bharat Chamber of Com- merce, Imperial Bank Bldg., Calcutta.
32. „ Kantilal J. Shah	.	.	.	.	„	Mill Gin Stores Merchants Association, 88/92, Nagdevi Street, Bombay-3.
33. „ Ambalal G. Shah	.	.	.	.	„	Mill Gin Stores Merchants Association, Bombay and State Trading Corporation of India, New Delhi.
34. „ C. G. Shah	}	.	.	.	„	The All India Ball Bearing Merchants Association, 524, Sandhurst Road, Bombay-4.
35. „ B. M. Mehta						
36. „ W. M. Karum Baya						
37. „ D. C. Malhotra						

F. CONSUMERS

38. Shri V. D. Desai	.	.	.	.	„	Crompton Parkinson (Works) Ltd., Haines Road, Worli Bombay-18.
39. „ Johns Samuel	.	.	.	.	„	Maharashtra State Road Transport Corporation, Central Stores, S. T. Pre- mises Bellasis Road, Bombay-8.
40. Shri R. K. Udeshi	.	.	.	.	„	National Machinery Manu- facturers Ltd., Kalwa, Thana.

41. Shri V. Subrahmaniam . . . Representing The Automobile Products of India Ltd., Agra Road, Bhandup, Bombay.
42. „ S. K. Basu . . . „ Controller of Stores Central Railway, V. T. Bombay.
43. Dr. J. N. Agarwal . . . „ Jay Engineering Works Ltd., (Usha Fans), 183-A, Prince Anwar Shah Dhakuria, Calcutta-31.
44. Shri M. J. Patel . . . „ Godrej & Boyce Mfg. Co. (P) Ltd., Lal Baug, Parel Bombay.
45. „ H. S. Sidhu . . . „ Matchwell Electricals India Ltd., P. O. Yeravda, Poona.
46. „ M. M. Kaul . . . „ Fan Makers' Association of India, India Exchange, India Exchange Place, Calcutta-1.
47. „ M. D' Mello . . . „ Engineering Asscn. of India, India Exchange place, Calcutta.
48. „ H. R. Varma . . . „ Indian Electrical Mfgs' Association India Ex-change, Calcutta.

I. DEALERS

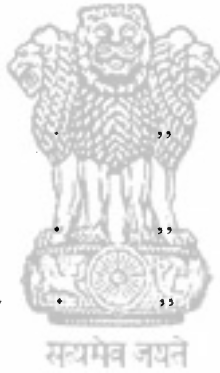
49. Shri G. N. Shah . . . „ Motor Trade Supply Co., Parekh Mansions, Sardar Patel Road, Bombay-4.
50. „ R. A. Patel . . . „ Associated Bearing Corporation, 163, Narayan Dhuru St. Bombay-3.

G. RAW MATERIAL SUPPLIERS

51. Shri K. N. R. Nair . . . „ T. I. and M. Sales Pvt. Ltd., United Bank of India Bldg., Sir P. M. Road, Bombay.
52. „ S. L. Narayan Rao . . . „ Carborundum Universal Ltd. P. B. No. 1677 11/12 North, Beach Road, Madras-1.
53. „ R. S. Mani . . . „ Special Steel Ltd., Village Moujae, Dattapara Road, Bombay-66.
54. „ G. L. Lewis . . . „ Grindwell Abrasives Ltd. Army & Navy Bldg., Mahatma Gandhi Road, Bombay-1.

H. GOVERNMENT DEPARTMENTS

- | | | | |
|-----|------------------------------------|--------------|--|
| 55. | Shri A. M. Mankikar . . . | Representing | Directorate General of Supplies and Disposals, N. I. Building, Parliament Street, New Delhi. |
| 56. | „ P. R. Nair . . . | „ | The Iron & Steel Controller, 33, Netaji Subhas Road, Calcutta. |
| 57. | „ M. U. Patankar . . . | „ | Indian Standards Institution, Manak Bhavan, 9, Mathura Road, New Delhi. |
| 58. | „ H. Rama Rao, Development Officer | „ | The Director General of Technical Development, Udyog Bhavan, Maulana Azad Road, New Delhi. |
| 59. | „ D. D. Basu } . . . | „ | The Development Commissioner, Small Scale Industries, Ministry of Industry & Supply, Udyog Bhavan, Maulana Azad Road, New Delhi. |
| 60. | „ B. L. Bansal } | | |
| 61. | „ S. K. Sethi . . . | „ | The Secretary, National Industrial Development Corporation, New Delhi. |
| 62. | „ S. K. Raizada . . . | „ | The Collector of Customs, Bombay. |
| 63. | „ S. Y. Tipnis . . . | „ | The Director of Industries, Government of Maharashtra, Bombay. |
| 64. | „ N. M. Soparkar . . . | „ | The Director of Industries, Government of Gujarat Ahmedabad. |



APPENDIX IV

(Vide Paragraph 5.1.4)

Statement showing names of manufacturers of rolling bearings, location of factory, number of workers employed etc.

Sl. No.	Name and address of the unit	Location of factory	Year of commencement of production		Other products manufactured	New items to be manufactured	Technical collaboration	Daily No. of workers employed	Staff employed		Details of capital structure
			Ball	Roller					Ind-ian	Non-Indian	
1	2	3	4	5	6	7	8	9	10	11	12
1	National Industries Limited, India Exchange, Ind-ia Exchange Place, Calcutta.	Jaipur Rajasthan	1950	..	Steel balls, Spindle inserts Axle boxes for railway wa-gons and locomot-ives.	Plans to manufac-ture taper roller bearings, steel ca-rtridges and rolled rings for bigger bearings. Also purchased one plant for manu-facturing rubber goods at Calcutta.	Entered into Tech. collaboration Agreements with (4 foreign Cos.) Hoffmann Manufacturing Co., Ltd., Chelmsford, Essex, Eng-land for manufacture of BALI BEARINGS. In consid-eration of this, a yearly payment of five thousand pounds payable on the 22nd day of August in each year.	2277	96	4	The Co. has a paid up capital of Rs. 60 lacs in ord- and pre-shares and a debenture loan of Rs. 50 lacs. The Co. is managed by the Mgt. Agents Birla Gwalior Private Ltd.

(ii) a sum equal to £ 2½% on the net invoices price of products manufactured by the said business and subsequently sold by it. Where, however products sold as aforesaid include components purchased by the Indian Co., (NET) from the Eng. Co. (Hoffmann) pursuant to this agreement, then and in that event for the purpose of calculating the sum upon which the said 2½% shall be payable the price payable, the price paid by the Indian Co. for such components shall be deducted from the net invoices price of the products.

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

Such payment shall be made in sterling in London.

II. Federal Mogul Bower Bearings Inc, Detroit Michigan, USA for manufacture of Tapper Roller Bearings.

In consideration of this agreement the Co. has to pay :

(a) Five per cent of the selling price of the Licensed products.

(b) Six per cent of the selling price of such licensed products sold, transferred or consigned for export from India.

III. Wilhelm Stahlecker GmbH West Germany :

In consideration of this agreement the Co. pays :

(a) The sum of 88,000 D.M. for initial plans, drawings specifications and other matters.

(b) A sum equal to two and one half per cent of the net sales (less discounts and returns) of products manufactured by N.E.I. Ltd. in India.

IV. *International Nickel Company Ltd., London :*

for manufacture of S.G. Iron. In consideration of this agreement the Co. has to pay :

a) Tonnage royalty based on the quantity of black castings of magnesium treated cast iron despatched from the foundry in saleable condition at three and one third per cent of price of Indian No. 2 Foundry Pig Iron subject to a minimum annual royalty of $\text{Rs. } 23-6-8$ where annual



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output of iron and steel castings is up to 1999 tons and Rs. 116.13.4, where the annual output is 8,000 tons or more.

2	Antifriction Bearings Corp. Ltd., Marshalls Building, 20 Ballard Road, Bombay-1.	1961 ..	Tapered roller bearings, cylindrical roller bearings, bearing components for special applications steel shots as grinding media for paint industry.	No plans to manufacture items other than bearings & B. components; only the range of manufacture of them will be increased in 1966.	Entered into technical and financial and also loan agreement with Siey-Daimler-Puch A.G., Walzgerwerk Steyr, Austria. Royalty payable: Rs. 13,000/- per annum subject to Indian taxes. Sig. 6,500 free of tax for ten years.	239	6	1	Auth. Capital 1,00,00,000 Sub-Capital 59,81,500/- Forfeited shares 21,250 LOANS ICICI. Rs. 32,55,345/- Collaboration : Rs. 8,08,645/- Percentage of capital held : Non-Indians: 8.59 Govts. : Nil Fin. Insts : 8.44.	Capital
3	Bharat Ball Bearing Co. Ltd., 49/1, Gariahat Road, Calcutta-19.	1963 ..	Nil	Propose to take up manufacture of cylindrical roller bearings, tapered roller bearings and railway axle boxes complete with roller bearings during the next three years. Also thinking to take up spherical roller bearings.	(1) Have a technical collaboration agreement with Fafnir Bearing Company of U.S.A. for the manufacture of Ball bearings. Under this, the company pays : (1) In consideration of the sale and transfer of the trade secrets and as purchase price therefor Bharat will pay or cause to be paid to Fafnir the sum of Rs. 4,00,000. (2) For ten years from the date upon which Bharat first effects sales of the products, a royalty of 4% on the net ex-factory realisation upon all sales of the products manufactured and sold by Bharat.	381	84	1	Managing Agents : Associated Industries Corp. = Share Capital 75-00 Lac Loan from Industrial Finance Corp. = 60-00 Lac Total : 135-00 Lac Percentage of capital held : Non-Indian : Nil Govts. : Nil Financial Institutions : 4-09.	
4	Associated Bearing Co. Ltd., Mahatma Gandhi Memorial Building, Netaji Subhash Road, Bombay.	1965 1965	(1) Specialised accessories of textile machinery (Pendulum weighting Arms with Cradles) and Top Rollers (2) Centring Sleeve Inserts. (3) Tape Tension Pulleys.	Additional Types of ball and tapered roller bearing during the next three years.	Entered into foreign collaboration agreement with AKTIEBOLAGET SVENSKA KULLAGERFABRIKEN Gothenburg (Sweden) Under this the company shall pay SKP : (1) In consideration of the know-how capital property-Rs. 8,00,000. (2) In consideration of acting as technical consultants to the company, a Research and Development Compensation which shall be 24 per cent of the net actual turnover of the company.	Not yet employed	6	..	Issued & Paidup Capital : 4,00,00,000 7% Dividends (1970-1980) 1,65,00,000 Percentage of capital held : Non-Indian: 60 Govts. : .. Financial Institutions : 10 Public 30 Total 100	

1	2	3	4	5	6	7	8	9	10	11	12
5	Precision Bearings India Ltd., Navelli House 15, Graham Road Ballard Estate, Bombay-1.	Makarpura, Baroda, Gujarat State.	1965	..	Nij	As per Accelerated Tooling Schedule 1965 & Tentative Tool Schedule 1966 to 1967 attached as confidential document to the replies to the questionnaire.	Entered into a technical collaboration Agreement with Norma Hoffmann Bearings Company Stanford Connecticut, division of Universal American Corporation of New York, U.S.A. under which the collaborator furnished the Company with initial know-how and plans for erecting the plant, installing utilities, setting up machinery and installing the various production processes. The Collaboration Agreement is for 10 years, and the foreign collaborator is obliged to furnish continuing technical assistance and product information to Precision Bearings India. The Collaborator received Rs. 7,15,000 in shares in full payment for their initial know-how and for the balance of the ten year period will receive a royalty, after Indian income tax deduction, of 2% of the value of the Company's net sales of products within India and 3% of the net value of the Company's net sales outside India.	112	17	5	Equity capital 105,00,000 Long Term Loan Cap 30,00,000 Overdrafts 17,00,000 Loans from Sponsor 15,00,000 Add. long term financing now being arranged 27,50,000. Percentage of total capital held. Non-Indian 28.57 Governments Nil Financial Institutions (I.C.I.C.I.) 1.82 Non-Indian (I.F.C.) 17.14.
								GRAND TOTAL		3,007	209 39

APPENDIX V

(Vide Paragraph 5.5)

Statement showing production of Rolling Bearings during 1962, 1963, 1964 and 1965 (Jan.-June) as furnished by the producers

(In thousand Nos.)

Sl. No.	Name of the unit	Ball Bearings			Adapter Ball Bearings			Roller Bearings		
		Upto 51 mm bore dia.	Above 51 mm bore dia.	Total	Upto 51 mm bore dia.	Above 51 mm bore dia.	Total	Upto 51 mm bore dia.	Above 51 mm bore dia.	Total
1	2	3	4	5	6	7	8	9	10	11
		1962								
1	National Engineering Industries Ltd.	3,840	4	3,844	28	1	29	@5	..	5
2	Antifriction Bearings Corporation Ltd.	81	4	85	..	..	..	..	..	..
3	Bharat Ball Bearing Co. Ltd.	..	..	..	..	..	..	..	..	..
4	Associated Bearing Co.	..	..	..	..	..	..	..	..	..
5	Precision Bearings India Ltd.	..	..	..	..	..	..	..	..	..
TOTAL		3,921	8	3,929	28	1	29	5	..	5
		1963								
1	National Engineering Industries Ltd.	4,123	..	4,123	29	..	29	..	..	..
2	Antifriction Bearings Corporation Ltd.	67	4	71	..	..	..	16	..	16
3	Bharat Ball Bearing Co. Ltd.	747	..	747	..	..	..	..	..	..
4	Associated Bearing Co.	..	..	..	..	..	..	..	..	..
5	Precision Bearings India Ltd.	..	..	..	..	..	..	..	..	..
TOTAL		4,937	4	4,941	29	..	29	16	..	16

1	2	3	4	5	6	7	8	9	10	11
1964										
1	National Engineering Industries Ltd. . .	4,014	12	4,026	14	1	15	@1	..	1
2	Antifriction Bearings Corporation Ltd. . .	99	3	102	..	..	..	188	27	215
3	Bharat Ball Bearings Co. Ltd. . .	1,442	..	1,442	7	..	7	..	..	..
4	Associated Bearing Co. . .	..	..	..	..	..	..	..	..	..
5	Precision Bearings India Ltd. . .	..	..	..	..	..	..	..	..	..
TOTAL		5,555	15	5,570	21	1	22	189	27	216
1965 (Jan.-June)										
1	National Engineering Industries Ltd. . .	2,407	10	2,417	9	1	10	..	..	..
2	Antifriction Bearings Corporation Ltd. . .	47	2	49	..	..	..	73	25*	98
3	Bharat Ball Bearings Co. Ltd. . .	586	1	587	38	..	38	..	..	..
4	Associated Bearing Co. . .	231	..	231	..	..	..	..	..	..
5	Precision Bearings India Ltd. . .	338	..	338	..	..	..	30	..	30
TOTAL		3,609	13	3,622	47	1	48	103	25	128

@ Assembled.

*Includes 3 of above 100 mm. bore dia.

APPENDIX VI

(Vide Paragraph 5.6)

Statement showing the estimates of production of Rolling Bearings during 1965, 1966, 1967 and 1968 as furnished by the manufacturers

(In thousand Nos.)

Sl. No.	Name of the unit	Ball Bearings		Adapter Ball Bearings		Roller Bearings		
		Upto 51 mm. bore dia.	Above 51 mm. bore dia.	Total	Upto 51 mm. bore dia.	Above 51 mm. bore dia.	Total	
1	2	3	4	5	6	7	8	9
1965								
1	National Engineering Industries Ltd.	3,968	..	3,968	30	2	32	..
2	Antifriction Bearings Corporation Ltd.	121	15	136	..	..	..	313
3	Bharat Ball Bearing Co. Ltd. . .	1,612	16	1,628	123	32	155	..
4	Associated Bearing Co. Ltd. . .	450	..	450	..	..	..	270
5	Precision Bearings India Ltd. . .	715	10	725	..	..	..	30
TOTAL		6,866	41	6,907	153	34	187	613

	1	2	3	4	5	6	7	8	9
				1966					
1	National Engineering Industries Ltd.	3,968	..	3,968	30	2	32	..	
2	Antifiction Bearings Corporation Ltd.	126	15	141	..	..	..	462	
3	Bharat Ball Bearing Co. Ltd.	2,144	19	2,163	140	45	185	250	
4	Associated Bearing Co. Ltd.	900	..	900	..	..	..	540	
5	Precision Bearings India Ltd.	1,550	50	1,600	..	..	..	200	
	TOTAL	8,688	84	8,772	170	47	217	1,452	88

	1967								
1	National Engineering Industries Ltd.	3,968	..	3,968	30	2	32	..	
2	Antifiction Bearings Corporation Ltd.	126	15	141	..	..	..	462	
3	Bharat Ball Bearings Co. Ltd.	2,690	28	2,718	152	50	202	500	
4	Associated Bearing Co. Ltd.	1,500	..	1,500	..	..	..	900	
5	Precision Bearings India Ltd.	2,300	100	2,400	..	..	..	300	
	TOTAL	10,584	143	10,727	182	52	234	2,162	

1968

1	National Engineering Industries Ltd.	3,968	..	3,968	30	2	32	..
2	Antifriction Bearings Corporation Ltd.	126	15	141	..	..	..	462
3	Bharat Ball Bearings Co. Ltd.	3,340	35	3,375	175	55	230	750
4	Associated Bearings India Ltd.	1,650	..	1,650	..	..	..	990
5	Precision Bearings India Ltd.	3,200	150	3,350	..	..	..	425
TOTAL		12,284	200	12,484	205	57	262	2,627

N.B.—(1) National Engineering Industries Ltd. has estimated the production of ball bearings approximately at 4 million Nos. for the year 1965-66 and expressed its inability to forecast the same for the subsequent three years due to the pendency of its expansion programme. However, for the purpose of the Commission's inquiry, the same figure of 4 million Nos. is taken throughout the four years.

(2) Antifriction Bearings Corporation Ltd. has given their estimates of production for 1965 and 1966 only. However, the estimated figure for 1966 is taken for the subsequent two years also.

APPENDIX VII

(Vide Paragraph 7.6)

N. I. D. C's estimates of requirement of Rolling Contact Bearings in India broken in to design groups and Technological size groups for 1965-66 and 1970-71

(Source : N. I. D. C. & D. G. T. D.)

(Figures in thousands)

Sl. No.	Type of Bearings	Precision		Bore 10 mm		Bore 10-30 mm		Bore 30-35 mm.		Bore 55-170 mm		Bore 170-250 mm		Bore above 250 mm		Aggregate Total	
		1965-66	1970-71	1965-66	1970-71	1965-66	1970-71	1965-66	1970-71	1965-66	1970-71	1965-66	1970-71	1965-66	1970-71	1965-66	1970-71
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ball Bearings																	
1	Radial Ball Bearings	1,190	2,170	2,375	4,985	1,490	2,215	1,500	3,035	282	530	15	26	..	..	6,852	12,961
2	Angular Contact Ball Bearings	555	1,000	990	1,640	690	1,460	575	1,045	120	225	7	13	..	..	2,937	5,383
3	Self Aligning Ball Bearings	..	..	350	670	195	380	156	300	25	45	2	5	..	..	728	1,400
4	Thrust Ball Bearings	65	130	245	480	125	265	147	270	25	50	1	2	..	..	608	1,197
TOTAL		1,810	3,300	3,960	7,775	2,500	4,320	2,378	4,650	452	850	25	46	..	..	11,125	20,941
Roller Bearings																	
1	Cylindrical Roller Bearings with short rollers	95	190	60	150	275	580	78	170	8	15	..	..	..	..	516	1,105
2	Cylindrical Roller Bearings with long rollers	..	..	40	85	242	480	50	85	8	15	..	..	..	..	340	665
3	Needle roller bearings	..	..	160	345	1,035	2,050	178	335	18	50	..	..	..	..	1,391	2,780

4	Roller Bearings with wound rollers	..	..	..	..	..	..	..	17	45	..	..	17	45
5	Tapered Roller Bearings	70	135	..	..	70	140	650	1,240	630	1,235	30	55	1,450 2,805
6	Spherical Roller Bearings	..	..	..	..	..	..	..	..	174	340	168	330	342 670
7	Thrust Roller Bearings	..	..	..	..	..	..	10	20	..	..	..	..	10 20
8	Self Aligning for Movable joints	..	..	50	95	..	..	..	..	..	..	..	..	50 95
Total		165	325	310	675	1,622	3,250	966	1,850	855	1,700	198	385	.. 4,116 8,185
9	TOTAL (BALL AND ROLLER BEARINGS)	1,975	3,625	4,270	8,450	4,122	7,570	3,344	6,500	1,307	2,550	223	431	.. 15,241 29,126
10	Other Machinery assumed as 5% of the above figures	99	180	214	420	206	380	167	325	65	129	11	22	.. 762 1,456
11	TOTAL	2,074	3,805	4,484	8,870	4,328	7,950	3,511	6,825	1,372	2,679	234	453	.. 16,003 30,582
12	Replacement 5% of the total stock	556	985	1,196	2,530	1,172	2,530	939	2,025	368	801	69	129	.. 4,300 9,000
13	GRAND TOTAL	2,630	4,790	5,680	11,400	5,500	10,480	4,450	8,850	1,740	3,480	303	582	.. 20,303 39,582

APPENDIX VIII

(Vide Paragraph 12.1.1)

Statement showing the Import Control Policy for Rolling Bearings for the licensing period April '65-March '66

Part and Sl. No. of I. T. C. Schedule 1	Description 2	Remarks 3
19 (1) Ball Bearings :—	(i) Ball bearings of 1" in bore (internal) diameter and below as specified in Appendix*14 (1) (a), 14(1) (b) and 14(1) (c).	(a) Import will be canalised through an agency approved by Government. (b) A. U. Please refer to Appendix 4*. (c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 1.43 per bearing. (d) Licences will also be issued subject to the condition that licence holders inform the licensing authority about the progress of imports.
(ii) Ball bearings of 1" in bore (internal) diameter and below other than those specified in Appendix* 14(1)(a), 14(1)(b) and 14(1)(c).		(a) Import will be canalised through an agency approved by Government. (b) A. U. Please refer to Appendix 4*. (c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 1.43 per bearing. (d) Licences will also be issued subject to the condition that licence holders inform the licensing authority about the progress of imports.

(iii) Ball Bearings above 1" in bore (internal) diameter and upto and including 2" in bore (internal) diameter as specified in Appendix* 14(2)(a), 14(2)(b) and 14(2)(c).

(iv) Ball bearings above 1" and upto and including 2" in bore (internal) diameter other than those specified in Appendix *14(2)(a), 14(2)(b) and 14(2)(c).



(v) Ball bearings above 2" in bore (internal) diameter upto and including 3" as specified in Appendix *14(3)(a) and 14(3)(b).

(a) Import will be canalised through an agency approved by Government.

(b) A. U. Please refer to Appendix 4*.

(c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 3.15 per bearing.

(d) Licences will also be issued subject to the condition that licence holders inform that licensing authority about the progress of imports.

(a) Import will be canalised through an agency approved by Government.

(b) A. U. Please refer to Appendix 4*.

(c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 3.15 per bearing.

(d) Licences will also be issued subject to the condition that licence holders inform the licensing authority about the progress of imports.

(a) Import will be canalised through an agency approved by Government.

(b) A. U. Please refer to Appendix 4*.

(c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 5.0 per bearing.

(d) Licences will also be issued subject to the conditions that licence holders inform the licensing authority about the progress of imports.

*of Red Book attached.

(vi) Ball bearings above 2" in bore (internal) diameter upto and including 3" other than those specified in Appendix*14(3) (a) and 14(3)(b).

- (a) Import will be canalised through an agency approved by Government.
- (b) A. U. Please refer to Appendix 4*.
- (c) Licences will be issued subject to both quantity and value as limiting factors. The quantity will be determined by converting the value of the licence at Rs. 5.0 per bearing.
- (d) Licences will also be issued subject to the condition that licence holders inform the licensing authority about the progress of imports.

(vii) Ball bearings above 3" in bore (internal) diameter specified in Appendix *14(4)(a) and 14(b).

- (a) Import will be canalised through an agency approved by Government.
- (b) A. U. Please refer to Appendix 4*.

(viii) Ball bearings over 3" in bore (internal) diameter other than those specified in Appendix* 14(4)(a) and 14(4)(b).

- (a) Import will be canalised through an agency approved by Government.
- (b) A. U. Please refer to Appendix 4*.

(ix) Component parts of ball bearings not otherwise specified and not shown under Appendix 14*.

- (a) Import will be canalised through an agency approved by Government.
- (b) A. U. Please refer to Appendix 4*.

19 (2) (i) Roller Bearings :

(a) Cylindrical roller bearings as specified in Appendix 14(5)*

- (i) Import will be canalised through an agency approved by Government.
- (ii) A. U. Please refer to Appendix 4*.

- (iii) Roller bearing imported without pedestals or housing can be imported against this serial number.
- (iv) Roller Assembly is also classified under S. No. 19(2)(1)/II and its import will also be allowed against licences granted for component parts of Roller bearings falling under S. No. 19(2)(ii)/II.

- (b) Cylindrical roller bearings not specified in Appendix*14(5)
- (ii) Component parts of Roller bearings including accessories, such as sleeves, nuts and washers.

Same as remarks against S. No. 19(2)(i)(a)/II.
(i) Import will be canalised through an agency approved by Government.

- (ii) Roller Assembly is also classified under S. No. 19(2)(i)/II and its import will also be allowed against licences granted for component parts of Roller bearings falling under S. No. 19(2)(ii)/II.

- 19(3) (i) (a) Taper roller bearings as specified in Appendix 14(6)*

(i) Import will be canalised through an agency approved by Government.

- (ii) A. U. Please refer to Appendix 4*.

- (b) Taper roller bearings not specified in Appendix 14(6)*

(i) Import will be canalised through an agency approved by Government.

- (ii) A. U. Please refer to Appendix 4*.

- (ii) Component parts of Taper Roller bearings

(i) Import will be canalised through an agency approved by Government.

- (ii) A. U. Please refer to Appendix 4*.

*of Red Book attached.

APPENDIX 4 of the Import Trade Control Policy for the year April '65-March '66 regarding the licensing policy for Actual users

Part & Sl. No. of the I.T.C. Schedule	Description	Remarks
19(1)	(i) Ball bearings of 1" in bore (internal) dia. and below as specified in Appendix*14(1)(a), 14(1)(b) and 14(1)(c).	
	(ii) Ball bearings etc. to (viii)	A. U. applications will be considered from industrial undertakings for their requirements of all bearings both for manufacturing purposes as well as maintenance of plant and equipment on the recommendations of the sponsoring authority.
	(ix) Component parts of ball bearings not otherwise specified and not shown under Appendix 14*.	A. U.
19(2)	(i) Roller bearings : (a) Cylindrical roller bearings as specified in Appendix 14(5)* (b) Cylindrical roller bearings not specified in Appendix 14(5)*	A. U.
	(ii) Component parts of roller bearings including accessories, such as sleeves, nuts and washers.	A. U.
19(3)	(i) (a) Taper roller bearings as specified in Appendix 14(6) (b) Taper roller bearings not specified in Appendix 14(6)*	A. U.
	(ii) Component parts of Taper roller bearings	

*of Red Book attached.

N.B.—The following basis will be adopted in considering A. U. applications for Ball, Roller and Taper Roller Bearings. The same basis will be followed for considering A. U. applications for components of specified Ball, Roller and Taper Roller Bearings :—

- (i) Ball bearings of one inch bore (internal) diameter and below detailed in Appendix 14(1) (a) of this book will not be allowed.
- (ii) Ball bearings of one inch bore (internal) diameter and below detailed in Appendix 14(1) (b) of this book may be allowed upto 25% of the certified requirements.
- (iii) Ball bearings of 1" bore internal diameter and below detailed in Appendix 14(1) (c) of this Book may be allowed upto 50% of the certified requirements.
- (iv) Ball bearings above 1" in bore internal diameter and upto and including 2" bore internal diameter detailed in Appendix 14(2) (a) of this Book will not be allowed.
- (v) Ball bearings above 1" in bore internal diameter and upto and including 2" bore internal diameter detailed in Appendix 14(2) (b) of this Book may be allowed upto 25% of the certified requirements.
- (vi) Ball bearings above 1" in bore internal diameter and upto and including 2" bore internal diameter detailed in Appendix 14(2) (c) of this Book may be allowed upto 50% of the certified requirements.
- (vii) Ball bearings above 2" bore internal diameter and upto and including 3" bore internal diameter detailed in Appendix 14(3) (a) of this Book may be allowed upto 25% of the certified requirements.
- (viii) Ball bearings above 2" bore internal diameter and upto and including 3" bore internal diameter detailed in Appendix 14(3) (b) of this Book may be allowed upto 50% of the certified requirements.
- (ix) Ball bearings above 3" in bore internal diameter as detailed in Appendix 14(4)(a) of this Book may be allowed upto 25% of the certified requirements.
- (x) Ball bearings above 3" bore internal diameter detailed in Appendix 14(4) (b) of this Book may be allowed upto 50% of the certified requirements.
- (xi) Ball bearings of non-restricted sizes may be allowed upto full certified requirements.
- (xii) Cylindrical Roller bearings of restricted types specified in Appendix 14(5) of this Book may be allowed upto 50% of the certified requirements.
- (xiii) Cylindrical Roller bearings on non-restricted sizes may be allowed upto full certified requirements.
- (xiv) Taper Roller bearings of restricted sizes specified in Appendix 14(6) of this book may be allowed upto 50% of the certified requirements.
- (xv) Taper Roller bearings of non-restricted sizes may be allowed upto full certified requirements.

APPENDIX VIII—(contd.)

Statement showing types of Rolling Bearings, the imports of which are restricted during the period April 1965-March 1966

[APPENDIX 14 (1) (a) OF RED BOOK]

(Section II—S. No. 19/II)

BANNED TYPES OF BALL BEARINGS FALLING UNDER S. NO. 19/II—List of Ball Bearings of 1" Bore (Internal) diameter and below

I.S.I. No.	Bearing Dimensions		
	Bore	Outside Diameter	Width
DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS			
<i>Light Series—Metric Sizes</i>			
10 BCo2	10 mm	30 mm	9 mm
12 BCo2	12 mm	32 mm	10 mm
15 BCo2	15 mm	35 mm	11 mm
17 BCo2	17 mm	40 mm	12 mm
20 BCo2	20 mm	47 mm	14 mm
	25 mm	52 mm	15 mm
20 BCo3			
<i>Medium Series—Metric Sizes</i>			
20 BCo3	20 mm	52 mm	15 mm

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
 - (2) A dust shield or plate on one or both sides of the bearings
 - (3) Any combination of items (1) and (2) above
- will be considered as banned for import purposes.

N. B.—The ban relates to standard bearings only. Import of extra precision and heavy duty bearings will be considered on merits.

APPENDIX 14 (1) (b)

(Section II—S. No. 19/II)

Restricted types of Ball Bearings failing under S. No. 19/II—List of Ball Bearings of 1" Bore (Internal) diameter and below

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions				
			Bore	Outside Diameter	Width		
DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS							
Medium Series—Metric Sizes							
10 BCo3	.	.	10 mm	35 mm	11 mm		
12 BCo3	.	.	12 mm	37 mm	12 mm		
15 BCo3	.	.	15 mm	42 mm	13 mm		
17 BCo3	.	.	17 mm	47 mm	14 mm		
25 BCo3	.	.	25 mm	62 mm	17 mm		
Light Series—Inch Sizes							
—	.	.	LS 5	RLS 4	1/2"	1.5/16"	3/8"
—	.	.	LS 7	RLS 5	5/8"	1.9/16"	7/16"
—	.	.	LS 8	RLS 6	3/4"	1.7/8"	9/16"
—	.	.	LS 9	RLS 7	7/8"	2"	9/16"
—	.	.	LS 10	RLS 8	1"	2.1/4"	5/8"
Medium Series—Inch Sizes							
—	.	.	MS 8	RMS 6	3/4"	2"	11/16"
—	.	.	MS 10	RMS 8	1"	2.1/4"	3/4"
Narrow Series—Inch Sizes							
—	.	.	S 3	EE 3	3/8"	7/8"	7/32"
—	.	.	S 7	EE 5	5/6"	1.3/8"	9/32"
—	.	.	S 8	EE 6	3/4"	1.5/8"	5/16"
—	.	.	S 9	EE 8	7/8"	1.7/8"	3/8"
SINGLE ROW ANGULAR CONTACT BALL BEARINGS							
Light Series—Metric Sizes							
17 BA 02	.	.	17 mm	40 mm	12 mm		
Special Bearings—Metric Sizes							
—	.	.	N 1025	EL 9	9 mm	24 mm	7 mm
—	.	.	N 797	L 17	17 mm	40 mm	10 mm

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Self Aligning Ball Bearings—Inch Sizes</i>					
—	U.S 5	RL 4	$\frac{1}{4}$ "	1.5/16"	3/8"
<i>Angular Contact* Bearing—Light Series—Inch Sizes</i>					
—	LS 10	ACD ALS 8 A	1"	2. $\frac{1}{4}$ "	5/8"
<i>Double Row Self Aligning all Journal Bearing—Light Series—Metric Sizes</i>					
10 BS 02	U 110	1200	10 mm	30 mm	9 mm

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above

will be considered as restricted bearing and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.



APPENDIX 14 (1) (C)

(Section II—S. No. 19/II)

Restricted types of Ball Bearings of 1" Bore (Internal) diameter and below

I. S. I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS					
Medium Series—Inch Sizes					
—	MS 7	RMS 5	5/8"	1.13/16"	5/8"
—	MS 9	RMS 7	7/8"	2.1/4"	11/26"
Extra Light Series—Single Thrust Bearings—Inch Sizes					
—	EW 5/8	B 5	5/8"	1.3/32"	9/32"
—	EW 3/4	B 6	3/4"	1.5/16"	9/32"
—	EW 7/8	B 7	7/8"	1.1/2"	3/8"
—	EW 1	B 8	1"	1.5/8"	3/8"
Extra Light Series—Single Thrust Bearings—Metric Sizes					
17 TA 11			17 mm	30 mm	9 mm
20 TA 11			20 mm	35 mm	10 mm
25 TA 11			25 mm	42 mm	11 mm
Light Series—Single Thrust Bearings—Inch Sizes					
—	W 3/4	O 6	3/4"	1.17/32"	5/8"
—	W 7/8	O 7	7/8"	1.21/32"	5/8"
—	W 1	O 8	1"	1.25/32"	5/8"
Light Series—Single Thrust Bearings—Metric Sizes					
15 TA 12			15 mm	32 mm	12 mm
17 TA 12			17 mm	35 mm	12 mm
20 TA 12			20 mm	40 mm	14 mm
25 TA 12			25 mm	47 mm	15 mm
Medium Series—Single Thrust Bearings—Metric Sizes					
25 TA 13			25 mm	52 mm	18 mm
Medium Series—Single Thrust Bearings—Inch Sizes					
—	MW 3/4	T 6	3/4"	1.9/16"	23/32"
—	MW 7/8	T 7	3/8"	1.13/16"	3/4"
—	MW 1	T 8	1"	2"	3/4"

I. S. I. No.	Haffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
SINGLE ROW ANGULAR CONTACT BALL BEARINGS					
Light Series—Metric Sizes					
20 BA02			20 mm	47 mm	14 mm
Medium Series—Self-Aligning Double Row Ball Journal Bearings—Metric Sizes					
25 BS03			25 mm	62 mm	17 mm
Special Bearing—Metric Sizes					
— N 7141	6004		20 mm	42 mm	12 mm
Light Series—Double Row Self-Aligning Adapter Bearings—Inch Sizes					
— UT 130 E 1506 E			1"	62 mm	16 mm
Light Series—Double Row Self-Aligning Ball Bearings—Inch Sizes					
— ULS 8	RL 6		3/4"	1 7/8"	9/16"
— ULS 9	RL 7		7/8"	2"	9/16"
— ULS 10	RL 8		1"	2 1/4"	5/8"

All the above bearings with special features such as:—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above

will be considered as restricted bearings and can only be imported as per conditions prescribed in the Red Book for restricted sizes.

APPENDIX 14 (2) (a)

S. No. 19/II

Banned Types of Ball Bearings above 1" in Bore (Internal) Diameter and upto and including 2" in Bore (Internal) Diameter

I. S. I. No.	Bearing Dimensions		
	Bore	Outside Diameter	Width

DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS

Light Series—Metric Sizes

30 BCo2		30 mm	60 mm	16 mm
35 BCo2		35 mm	72 mm	17 mm

Medium Series—Metric Sizes

30 BCo3		30 mm	72 mm	19 mm
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All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above.

will be considered as banned for import purposes.

N.B.—The ban relates to standard bearings only. Import of Extra Precision and Heavy Duty bearings will be considered on merits.



APPENDIX 14 (2) (b)

S. No. 19/II

Restricted Types of Ball Bearings above 1" in Bore (Internal) Diameter and upto and including 2" in Bore (Internal) Diameter.

I. S. I. No.	Bearing Dimensions		
	Bore	Outside Diameter	Width

DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS

Light Series—Metric Sizes

35 BCo2	. . .	35 mm	72 mm	17 mm
40 BCo2	. . .	40 mm	80 mm	18 mm
45 BCo2	. . .	45 mm	85 mm	19 mm
50 BCo2	. . .	50 mm	90 mm	20 mm

Medium Series—Metric Sizes

35 BCo2	. . .	35 mm	80 mm	21 mm
40 BCo3	. . .	40 mm	90 mm	23 mm
45 BCo3	. . .	45 mm	100 mm	25 mm
50 BCo3	. . .	50 mm	110 mm	27 mm

Medium Series—Inch Sizes

MS 12½ RMS II	1½"	3½"	¾"
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SINGLE ROW ANGULAR CONTACT BALL BEARINGS

Light Series—Metric Sizes

35 BAo2	. . .	35 mm	72 mm	17 mm
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All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above

will be considered as restricted bearings and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.

APPENDIX 14(2) (c)

S. No. 19/II

*Restricted Types of Ball Bearings above 1" in Bore (Internal) Diameter
and upto and including 2" Bore (Internal) Diameter*

I. S. I. No.	Haffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
DEEP GROOVE SINGLE ROW RADIAL BALL BEARINGS					
Light Series—Metric Sizes					
..	140 W	..	40 mm	80 mm	18 mm
Light Series—Inch Sizes					
..	LS 11	RLS 9	1·1/8"	2·1/2"	5/8"
..	LS 12	RLS 10	1·1/4"	2·3/4"	11/16"
..	LS 12½	RLS 11	1·3/8"	3"	11/16"
..	LS 13	RLS 12	1·1/2"	3·1/4"	3/4"
..	LS 13½	RLS 13	1·5/8"	3·1/2"	3/4"
..	LS 14	RLS 14	1·3/4"	3·3/4"	13/16"
..	LS 14½	RLS 15	1·7/8"	4"	13/16"
..	LS 15	RLS 16	2"	4"	13/16"
Medium Series—Inch Size					
..	MS 11	RMS 9	1·1/8"	2·13/16"	13/16"
..	MS 12	RMS 10	1·1/4"	3·1/8"	7/8"
..	MS 13	RMS 12	1·1/2"	3·3/4"	15/16"
..	MS 13½	RMS 13	1·5/8"	4"	15/16"
..	MS 14	RMS 14	1·3/4"	4·1/4"	1·1/16"
..	MS 14½	RMS 15	1·7/8"	4·1/2"	1·1/16"
..	MS 15	RMS 16	2"	4·1/2"	1·1/16"
Light Series Double Row Self-Aligning Ball Bearings—Metric Sizes.					
30 BS02	.	.	30 mm	62 mm	1 mm
40 BS02	.	.	40 mm	80 mm	18 mm
45 BS02	.	.	45 mm	85 mm	19 mm
Medium Series—Metric Sizes					
30 BS03	.	.	30 mm	72 mm	19 mm
Medium Series—Inch Sizes					
..	MSN 14	.	1·3/8"	4·5/8"	1·1/8"

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Light Wide Series—Metric Sizes</i>					
.. . . .	U 140 W	2208	40 mm	80 mm	23 mm
.. . . .	U 145 W	2209	45 mm	85 mm	23 mm
<i>Extra Light Series—Single Thrust Bearings—Metric Sizes</i>					
30 TA11	. . .		30 mm	47 mm	11 mm
35 TA11	. . .		35 mm	52 mm	12 mm
40 TA11	. . .		40 mm	60 mm	19 mm
45 TA11	. . .		45 mm	65 mm	14 mm
50 TA11	. . .		50 mm	70 mm	14 mm
<i>Extra Light Series—Single Thrust Bearings—Inch Sizes</i>					
	EW 1-1/8	EW 1-1/8	1-1/8"	1-3/4"	3/8"
<i>Light Series—Single Thrust Bearings—Metric Sizes</i>					
30 TA12	. . .		30 mm	52 mm	16 mm
35 TA12	. . .		35 mm	62 mm	18 mm
40 TA12	. . .		40 mm	68 mm	19 mm
45 TA12	. . .		45 mm	73 mm	20 mm
50 TA12	. . .		50 mm	70 mm	22 mm
<i>Light Series—Single Thrust Bearings—Inch Sizes</i>					
	W 1-1/8	0 9	1-1/8"	1-29/32"	5/8"
	W 1-1/4	0 10	1-1/4"	2-3/32"	23/32"
	W 1-3/8	0 11	1-3/8"	2-7/32"	23/32"
	W 1-1/2	0 12	1-1/2"	2-11/32"	23/32"
	W 1-5/8	0 13	1-5/8"	2-15/32"	23/32"
	W 1-3/4	0 14	1-3/4"	2-11/16"	3/4"
	W 1-7/8	0 15	1-7/8"	2-13/16"	3/4"
	W 2	0 16	2"	2-31/32"	3/4"
<i>Medium Series—Single Thrust Bearing—Metric Sizes</i>					
30 TA13	. . .		30 mm	60 mm	21 mm
35 TA13	. . .		35 mm	68 mm	24 mm
40 TA13	. . .		40 mm	78 mm	26 mm
45 TA13	. . .		45 mm	85 mm	28 mm
50 TA13	. . .		50 mm	95 mm	31 mm
<i>Medium Series—Single Thrust Bearings—Inch Sizes</i>					
	MW 1-1/8	T 9	1-1/8"	1-1/4"	7/8"
	MW 1-1/4	T 10	1-1/4"	2-1/2"	1"

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
	MW 1½	T 12	1·1/2"	2·7/8"	1·1/8"
	MW 1½	T 14	1·3/4"	3·5/16"	1·1/4"
	MW 2	T 16	2"	3·11/16"	1·3/8"
<i>Heavy Series—Single Thrust Bearings—Metric Sizes</i>					
35 TA14			35 mm	80 mm	32 mm
<i>Inch sizes</i>					
	HW 1½	VH 12	1·½"	3·½"	1·¾"
<i>Light Series—Double Thrust Bearings—Metric Sizes</i>					
	52206		30 mm	52 mm	29 mm
<i>Medium Series—Double Thrust Bearings—Metric Sizes</i>					
	54308		40 mm	82 mm	59 mm
<i>Light Series—Double Row Self-Aligning Adapter Bearings—Inch Sizes</i>					
	UT 140 E	1508E	1·¼"	80 mm	18 mm
	UT 145 E	1509E	1·½"	85 mm	19 mm
	UT 155 E	1511E	2"	100 mm	21 mm
<i>Light Wide Series—Double Row Self-Aligning Adapter Bearings—Inch Sizes</i>					
..	2508E		1·1/4"	80 mm	23 mm
..	2509E		1·1/2"	85 mm	23 mm
	2511E		2"	100 mm	25 mm
<i>Light Series—Double Row Self-Aligning Adapter Bearings—Metric Sizes</i>					
	UT 140	1508	35 mm	80 mm	18 mm
	UT 145	1509	40 mm	85 mm	19 mm
	UT 155	1511	50 mm	100 mm	21 mm
<i>Light Wide Series—Double Row Self-Aligning Adapter Bearings—Metric Sizes</i>					
..	2508		35 mm	80 mm	23 mm
..	2509		40 mm	85 mm	23 mm
..	2511		50 mm	100 mm	25 mm
<i>Medium Series—Single Row Angular Contact Ball Bearings—Metric Sizes</i>					
40 BA03			40 mm	90 mm	23 mm
50 BA03			50 mm	110 mm	27 mm
<i>Heavy Series—Single Row Angular Contact Ball Bearings—Metric Sizes</i>					
45 BA04			45 mm	120 mm	29 mm

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Light Series—Double Row Self-Aligning Ball Bearings—Inch Sizes</i>					
	ULS 11	RL 9	1·1/8"	2·1/2"	5/8"
	ULS 12	RL 10	1·1/4"	2·3/4"	11/16"
	ULS 13	RL 12	1·1/2"	3·1/4"	3/4"
	ULS 13·1/2"	RL 13	1·5/8"	3·1/2"	3/4"

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination on items (1) and (2) above

will be considered as restricted bearing and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.



APPENDIX 14(3) (a)

S. No. 19/II

Restricted Types of Ball Bearings above 2" in Bore (Internal) Diameter and upto and including 3"

I.S.I. No.	Bearing Dimensions		
	Bore	Outside Diameter	Width
<i>Single Row Angular Contact Ball Bearing Light Series—Metric Sizes</i>			
60BAo2	60 mm	100 mm	22 mm
<i>Deep Groove Single Row Radial Ball Bearing—Light Series—Metric Sizes</i>			
55 BCo2	55 mm	100 mm	21 mm

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above

will be considered as restricted bearing and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.



APPENDIX 14(3) (b)

S. No. 19/II

Restricted Types of Ball Bearings above 2" in Bore (Internal) Diameter and upto and including 3"

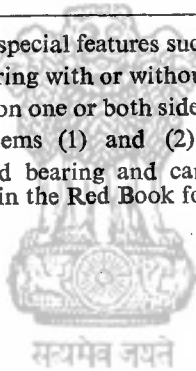
I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions				
			Bore	Outside diameter	Width		
<i>Extra Light Series—Single Thrust Bearings—Metric Sizes</i>							
55 TA11	.	.	55 mm	78 mm	16 mm		
60 TA11	.	.	60 mm	85 mm	17 mm		
70 TA11	.	.	70 mm	95 mm	18 mm		
<i>Light Series—Single Thrust Bearings—Metric Sizes</i>							
55 TA12	.	.	55 mm	90 mm	25 mm		
60 TA12	.	.	60 mm	95 mm	26 mm		
65 TA12	.	.	65 mm	100 mm	27 mm		
<i>Light Series—Single Thrust Bearings—Inch Sizes</i>							
—	..	..	W 2 1/4	0 18	2.1/4"	3.11/32"	7/8"
—	..	..	W 2.1/2	0 20	2.1/2"	3.23/32"	1"
—	..	..	W 2.3/4	0 22	2.3/4"	4.1/32"	1"
—	..	..	W 2.7/8	0 23	2.7/8"	4.5/32"	1"
—	..	..	W 3	0 24	3"	4.3/8"	1.1/8"
<i>Medium Series—Single Thrust Bearings—Metric sizes</i>							
60 TA 13	.	.	60 mm	110 mm	35 mm		
75 TA 13	.	.	75 mm	135 mm	44 mm		
<i>Medium Series—Single Thrust Bearings—Inch Sizes</i>							
—	.	.	MW 2 1/4	T 18	2.1/4"	4.1/4"	1.11/16"
—	.	.	MW 2 1/2	T 20	2.1/2"	4.3/4"	2"
<i>Light Standard Series—Double Row Self-Aligning Adapter Bearings—Inch Sizes</i>							
—	.	.	UT 175E	1515 E	2.1/2"	130 mm	25 mm
—	.	.	UT 185E	1517 E	3"	150 mm	28 mm
<i>Metric Series</i>							
—	.	.	UT 175	1515	65 mm	130 mm	25 mm

I.S.I. No.	Hoffmann No.	S. K. F. No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Light Wide Series—Double Row Self-Aligning Adapter Bearings—Inch Sizes</i>					
—		2515 E	2·1/2"	130 mm	31 mm
<i>Metric Size</i>					
—		2515	65 mm	130 mm	31 mm
<i>Light Series—Double Row Self-Aligning Small Bearings—Metric Sizes</i>					
73 BSo2	.	.	75 mm	130 mm	25 mm
<i>Light Wide Series—Double Row Self-Aligning Ball Bearings—Metric Sizes</i>					
—		U 175· W 2215	75 mm	130 mm	31 mm

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
- (2) A dust shield or plate on one or both sides of the bearings
- (3) Any combination of items (1) and (2) above

will be considered as restricted bearing and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.



APPENDIX 14(4) (a)

S. No. 19/II

Restricted Types of Ball Bearings above 3" in Bore (Internal) Diameter

I.S.I. No.	Hoffmann No.	S.K.F. No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Double Row Self-Aligning Ball Journal Bearing—Light Series—Metric Sizes</i>					
85 BS 02	.	.	85 mm	150 mm	28 mm

All the above bearings with special features such as :—

- (1) A groove in the outer ring with or without loose ring in the groove
 - (2) A dust shield or plate on one or both sides of the bearings
 - (3) Any combination of items (1) and (2) above
- will be considered as restricted bearing and can only be imported within the quota and conditions prescribed in the Red Book for restricted sizes.



APPENDIX 14(4) (b)

S. No. 19/II

Restricted types of Ball Bearings above 3" in Bore (Internal) Diameter

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Extra Light Series—Single Thrust Bearings—Metric sizes</i>					
80 TA11	.	.	80 mm	105 mm	19 mm
100 TA11	.	.	100 mm	135 mm	25 mm
<i>Light Series—Single Thrust Bearings—Inch Sizes</i>					
			W 3·1/4	3·1/4"	4·13/16" 1 1/4"

N.B.—(i) The dimensions shown against all adapter ball bearing as shown in Appendix 14(2) and (3) are the internal bore of the sleeves fitted to the bearing and not the internal bore of the bearing without the sleeves. As such, all Adapter Ball Bearings as shown in Appendix 14 (2) and (3) can only be imported within the restricted imports irrespective of the fact whether they are imported with or without the sleeves. The face value of restriction for any single type of Adapter Bearings will hence forward deem to apply jointly for both inch sizes and millimeter sizes in case of Adapter Bearings. In other words ceilings under the face value of each size will be a joint ceiling for inch as well as the corresponding millimeter size. This will also apply to non-restricted types of Adapter ball bearings.

- (ii) In addition to the two makes given in the appendices, viz., Hoffmann and SKF ball bearings of other makes falling within the specific sizes and specific types mentioned in the appendices will also be treated as restricted types and will be licensed within the restricted imports.
- (iii) Catalogue references quoted in the appendix are purely for purposes of identification and no representation from any manufacturer Indian or foreign for inclusion of his brand will be entertained.

APPENDIX 14(5)

S. No. 19(2)(i)(a)/II

Restricted Types of Roller Bearings

I.S.I. No.	Hoffmann No.	SKF No.	Bearing Dimension		
			Bore	Outside diameter	Width
<i>Cylindrical Roller Bearings—Metric Series</i>					
25 RNo2 . . .			25 mm	52 mm	15 mm
30 RNo2 . . .			30 mm	62 mm	16 mm
35 RNo2 . . .			35 mm	72 mm	17 mm
40 RNo2 . . .			40 mm	80 mm	18 mm
45 RNo2 . . .			45 mm	85 mm	19 mm
50 RNo2 . . .			50 mm	90 mm	20 mm
30 RNo3 . . .			30 mm	72 mm	19 mm
35 RNo3 . . .			35 mm	80 mm	21 mm
40 RNo3 . . .			40 mm	90 mm	23 mm
45 RNo3 . . .			45 mm	100 mm	25 mm
50 RNo3 . . .			50 mm	110 mm	27 mm



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APPENDIX 14(6)

S. No. 19(3)(i)(a)/II

Restricted Types of tapered Roller Bearings falling under S. No. 19/II

I. S. I. No.	Hoffmann No.	SKF No.	Bearing Dimensions		
			Bore	Outside Diameter	Width
<i>Tapered Roller Bearings—Metric Sizes</i>					
		30204	20 mm	47 mm	14 mm
		30205	25 mm	52 mm	15 mm
		30206	30 mm	62 mm	16 mm
		30209	45 mm	85 mm	19 mm
		30302	15 mm	42 mm	13 mm
		30306	30 mm	72 mm	19 mm
		32306	30 mm	72 mm	27 mm
		32211	55 mm	100 mm	25 mm
		32212	60 mm	110 mm	28 mm
		32214	70 mm	125 mm	31 mm

APPENDIX IX

(Vide paragraph 12.2)

Statement showing the country-wise imports of Rolling Bearings during 1963, 1964 and 1965

Specification and country of origin	April, 1962—March, 1963		April, 1963—March, 1964		April, 1964—March, 1965	
	Quantity (Kgs.)	Value (Rs.)	Quantity (Nos.)	Value (Rs.)	Quantity (Nos.)	Value (Rs.)
1	2	3	4	5	6	7
1. Adapter Ball Bearings upto 2" Bore						
Australia	140	1,162	..	..	147	1,518
Austria	3,418	37,947	4,961	23,281	8,512	42,234
Belgium	..	..	182	934	70	718
Bulgaria	..	..	..	..	5,024	30,709
Czechoslovak	..	..	38,878	74,679	16,877	34,277
Germany West	8,906	112,466	24,869	174,309	31,809	219,399
Italy	511	5,442	8,293	35,099	1,712	10,703
Japan	180	1,812	118	637	1,203	9,178
Kenya	..	..	177	2,785	..	..
Netherlands	..	..	132	2,267	1,519	14,600
Poland	26	257	2,785	13,801	18,858	64,847
QTR TRL OMN	66	251	194	930	..	..
Sweden	7,350	91,227	18,259	133,525	8,873	76,500
Switzerland	823	9,517	2,299	11,613	6,720	31,143

U.K.	.	.	.	4,755	60,468	20,543	120,401	14,471	125,274
Roumania	.	.	.	..	..	13,750	73,412	..	..
U.S.A.	.	.	.	146	2,586	4,157	37,625	8,186	123,179
U.S.S.R.	.	.	.	513	5,362	27,902	106,014	22,526	93,475
Singapore	.	.	.	1	125	..	..	..	..
Yugoslavia	.	.	.	..	..	..	..	25	224
Hungary	.	.	.	..	..	..	..	2,000	10,560
Bahrain IS	.	.	.	20	167	367	932	..	..

TOTAL . . . 26,855 328,789 167,866 812,244 148,532 938,618

2. Adapter Ball Bearings above 2" Bore

Austria	.	.	.	..	..	5,098	33,158	2,863	19,580
Belgium	.	.	.	..	..	..	..	2	225
Czechoslovak	.	.	.	..	..	625	8,071	6,481	24,313
Roumania	.	.	.	..	..	6,875	57,238	..	..
France	.	.	.	..	..	..	..	54	188
Germany West	.	.	.	..	..	4,427	42,383	12,590	145,345
Italy	.	.	.	..	..	1,311	11,684	3,021	11,841
Switzerland	.	.	.	..	..	738	6,629	28	771
Japan	.	.	.	..	..	8	44	785	5,026
Poland	.	.	.	..	..	10	10,304	2,324	4,893
QTR TRL OMN	.	.	.	..	..	53	254	..	..
Sweden	.	.	.	..	..	7,388	100,146	3,718	44,177
U.K.	.	.	.	..	..	4,118	68,336	9,878	70,887

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2. Adapter Ball Bearings upto 2" Bore—contd.

Germany East	..	..	30	378	..	..
Hungary	..	..	59	547	17,550	26,731
Bulgaria	..	..	..	..	4,251	18,514
Canada	..	..	116	695	..	..
Yugoslavia	..	..	24	2,404	..	..
U.S.A.	..	..	954	25,505	458	25,258
U.S.S.R.	..	..	13,773	114,582	9,892	49,599
Bahrein	..	..	45	649	..	..
TOTAL	..	..	45,652	483,007	73,895	447,368

3. Ball Bearing upto 2" Bore NES

Australia	..	818	13,529	5,337	12,795	1,001	6,667
Austria	..	53,944	639,097	102,540	383,449	29,590	124,197
Belgium	..	50	578	1,251	4,016	3,407	15,969
Bulgaria	..	..	..	..	..	32,698	171,838
Canada	..	143	3,099	1,814	8,276	3	411
Czechoslovak	..	44,262	624,061	206,264	411,715	120,783	561,029
France	..	1,828	33,354	3,533	36,955	5,309	54,244
Germany East	..	1	36	383	4,708	3,151	10,130
Germany West	..	171,022	3,124,062	425,241	2,912,595	360,926	2,778,603
Hungary	..	764	8,477	1,022	19,088	19,609	85,327

Italy	50,634	649,589	139,296	414,817	146,057	536,665
Japan	34,105	294,097	6,719	29,143	1,497	20,866
Kenya	340	4,883	..	..	3,614	36,403
Malaya Fedr.	..	..	..	..	45	88
Netherlands	301	2,229	1,248	6,508	851	6,447
Denmark	..	..	3	352	..	..
Poland	8,308	85,847	14,903	54,094	56,574	271,988
Roumania	3,816	33,400	21,432	102,192	6,858	32,353
Sweden	43,209	626,055	147,959	478,483	176,555	440,738
Switzerland	3,360	40,356	5,362	30,258	11,812	56,797
U.K.	158,527	1,982,507	149,783	861,496	231,754	1,121,756
U.S.A.	33,022	522,664	165,786	1,308,533	859,343	2,523,102
U.S.S.R.	166,875	1,634,777	249,054	853,824	261,986	915,031
Yugoslavia	99	1,393	470	2,445	32	376
Bahrein	765	3,941	1,357	4,610	..	..
QTR TRL OMN	1,729	15,187	4,290	13,892	..	..
TOTAL	778,787	10,353,947	1,655,047	7,954,244	2,333,437	9,771,025

4. Ball Bearings above 2" Bore NES

Australia	804	10,810	142	875	73	2,948
Austria	32,817	367,123	9,451	92,575	15,771	121,568
Belgium	1,371	57,526	..	..	827	20,810

1	2	3	4	5	6	7
4. Ball Bearing above 2" Bore NES.—contd.						
QTR TRL OMN	285	4,298	474	8,839	..	..
Bulgaria	..	..	..	..	7,717	82,468
Czechoslovak	35,475	366,939	22,472	207,464	41,403	255,380
Germany East	..	..	33	730	343	8,223
Germany West	407,774	4,456,184	49,791	957,355	41,156	888,847
Hungary	10	125	29	1,817	10,685	65,757
Italy	96,390	1,043,711	18,573	249,927	31,190	279,502
Japan	314,062	1,560,721	118	7,628	1,405	29,831
Norway	110	864	..	..	7	1,334
Poland	186	4,712	10,832	83,006	24,644	167,210
Roumania	19,477	143,532	15,115	133,326	17,347	150,356
Sweden	292,778	2,276,542	53,372	573,667	20,399	371,367
Switzerland	6,652	79,257	3,473	37,542	907	30,730
France	966	15,885	30	4,322	..	..
U.K.	191,875	2,568,726	42,030	934,145	46,838	640,051
U.S.A.	38,892	716,014	48,215	1,310,500	45,041	947,982
U.S.S.R.	190,357	1,045,263	156,670	1,648,858	101,596	1,122,081
Netherlands	920	8,139	51	2,711	..	..
Yugoslavia	191	2,322	..	..	12	191
Bahrain IS	195	1,910	235	3,850	..	..
TOTAL	1,585,515	14,831,607	431,106	6,259,137	407,321	5,186,636

5. Thrust Ball Bearings upto 2" Bore

Australia	..	..	..	..	..	85	2,030
Belgium	..	..	..	..	..	1	45
Sweden	..	..	386	..	..	236	3,384
Canada	..	..	..	..	3,553	20	1,523
Czechoslovak	..	..	650	..	16,723	520	2,286
Spain	..	..	24	..	435	..	..
France	..	..	2	..	137	20	297
Germany West	..	..	24,716	..	194,819	22,769	127,641
Hungary	..	..	..	..	..	7,668	30,844
Italy	..	..	10,049	..	24,250	14,318	37,864
Austria	..	..	1,432	..	8,109	685	2,673
U.K.	..	..	42,493	..	188,051	20,822	144,779
Poland	..	..	700	..	1,775	1,313	4,093
U.S.A.	..	..	3,006	..	29,416	4,192	47,491
Switzerland	..	..	167	..	1,261	372	2,412
U.S.S.R.	..	..	13,649	..	52,173	29,859	117,272
Roumania	..	..	17,369	..	60,911	5,301	17,358
TOTAL	..	..	114,643	..	581,613	108,181	541,992

6. Thrust Ball Bearings above 2" Bore.

Australia	..	..	..	..	..	..	..
Austria	..	..	1,067	..	7,502	310	5,321
Belgium	..	..	..	..	..	..	..
Bulgaria	..	..	..	..	..	..	..

1 2 3 4 5 6 7

6. Thrust Ball Bearings above 2" Bore—contd.

Czechoslovakia	..	..	650	5,440	88	1,147
Denmark	..	..	..	..	2	727
France	..	..	400	4,505	106	1,651
Germany West	..	..	5,846	77,975	3,899	71,568
Hungary	..	..	..	..	750	7,519
Italy	..	..	824	14,693	127	3,145
Japan	..	..	..	..	3	182
Netherlands	..	..	1	1,913	128	2,095
Poland	..	..	1,643	11,858	490	5,399
QTR TRL OMN	..	..	..	..	..	..
Roumania	..	..	..	..	..	..
Sweden	..	..	1,060	18,257	481	14,734
Switzerland	..	..	934	9,505	..	..
U.K.	..	..	4,717	163,502	7,785	208,335
U.S.A.	..	..	878	87,530	3,879	157,628
U.S.S.R.	..	..	532	2,458	633	26,514
Yugoslavia	..	..	..	..	..	..
Canada	..	..	..	..	4	7,489

TOTAL .. 18,552 405,140 18,685 513,454

7. Tapered Roller Bearings

Bulgaria	..	..	..	..	1,691	18,300
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Austria	30,092	363,615	62,706	541,389	100,629	724,707
Bahrein I. S.	..	..	652	5,500	..	..
Belgium	255	2,562	5,092	7,986	1,950	10,011
Canada	..	..	93	752	..	..
Czechoslovakia	68,626	582,172	109,283	981,022	113,123	899,146
France	11,411	198,344	5,984	346,941	2,995	294,386
Germany East	..	..	4	700	..	..
Germany West	72,698	908,888	72,840	981,776	168,435	1,420,437
Hungary	149	1,647	140	3,950	10,723	144,917
Italy	48,886	608,266	86,057	572,337	100,301	691,290
Japan	4,444	50,907	4,557	20,441	28,202	96,855
Kenya	45	804	9	162	192	2,425
Netherlands	35,433	302,739	21,165	116,176	15,346	109,337
Poland	33,137	319,217	56,851	480,054	51,101	314,235
QTR TRRL OMAN	3,135	31,243	406	6,076	50	498
Roumania	698	4,055	7,623	68,916	24,070	200,931
Singapore	..	..	5,485	4,945	..	..
Sweden	65,453	665,033	52,981	589,094	65,037	759,709
Switzerland	699	8,307	548	8,871	94	12,179
U.K.	88,712	1,182,750	81,396	1,090,673	90,180	1,297,453
U.S.A.	227,281	3,198,964	506,927	4,953,756	873,463	7,811,310
U.S.S.R.	81,644	867,721	121,133	761,214	198,202	1,548,331
Australia	432	8,329	..	..	806	12,305
Muscat	145	814	..	..	..	..
Yugoslavia	25	172	..	..	1,008	17,020
Hongkong	90	1,995	..	..	..	..
TOTAL	768,490	9,308,564	1,201,922	11,542,731	1,847,598	16,385,782

8. *Roller Bearings NES*

	1	2	3	4	5	6	7
Austria	.	.	.	23,822	658,703	44,308	320,508
Belgium	.	.	.	183	12,023	742	17,203
Bulgaria	.	.	.	..	..	717	7,418
Canada	.	.	.	18	503	1	12
Czechoslovakia	.	.	.	41,154	442,158	31,585	549,826
Bahrain I.S.	.	.	.	32	1,472	..	..
Denmark	.	.	.	..	..	4	8,048
France	.	.	.	1,005	93,430	161	10,394
Germany East	.	.	.	94	1,859	1,093	8,201
Germany West	.	.	.	94,308	1,962,216	96,634	3,534,584
Hungary	.	.	.	..	..	12,100	44,302
Italy	.	.	.	16,065	321,856	56,108	474,751
Japan	.	.	.	56,500	647,672	44,674	350,042
Netherlands	.	.	.	227	557	313	3,523
Norway	.	.	.	..	..	4	208
Poland	.	.	.	2,398	59,348	4,764	77,289
Rohd. Nys. Fd.	.	.	.	..	..	6	912
Roumania	.	.	.	1,662	45,007	18,201	359,978
OTR TRL OMN	.	.	.	156	7,325	..	..
Sweden	.	.	.	29,604	1,965,461	38,176	3,260,696
Switzerland	.	.	.	1,879	77,338	3,283	89,508
U.K.	.	.	.	66,510	1,740,545	65,643	1,367,674
U.S.A.	.	.	.	105,043	2,028,527	195,336	2,175,015

U.S.S.R.	.	.	.	.	39,391	512,783	56,609	1,128,964
Yugoslavia	.	.	.	.	45	12,780	49	4,046
Australia	.	.	.	.	27	282	..	..
TOTAL	.	.	.	.	483,118	10,591,845	670,511	13,793,102
9. Thrust Type Roller Bearings								
Australia	.	.	.	.	..	..	3,000	9,631
Austria	.	.	.	.	13,149	77,029	1,223	3,641
Bulgaria	.	.	.	.	..	..	590	38,024
Czechoslovakia	.	.	.	.	..	..	57	916
France	.	.	.	.	..	..	15	186
Germany East	.	.	.	.	..	..	63	11,037
Hungary	.	.	.	.	80	1,754	..	..
Switzerland	.	.	.	.	32	6,150	..	..
Yugoslavia	.	.	.	.	972	15,872	..	..
Netherlands	.	.	.	.	3	268	..	..
Germany West	.	.	.	.	7,371	200,084	12,750	210,253
Italy	.	.	.	.	2,426	17,508	1,413	29,803
Japan	.	.	.	.	150	16,034	3,114	12,859
Poland	.	.	.	.	..	..	257	3,463
Roumania	.	.	.	.	958	33,954	42	5,074
Sweden	.	.	.	.	335	29,942	58	8,645
U.K.	.	.	.	.	7,277	182,652	6,049	272,440
U.S.A.	.	.	.	.	5,021	221,478	4,035	226,196
U.S.S.R..	.	.	.	.	762	12,779	1,180	111,131
TOTAL	.	.	.	.	38,536	815,504	33,846	943,279

(In kgs.)

1	2	3	4	5	6	7
10. Parts of Ball and Roller Bearings						
QTR TRL OMN	178	746	218	593	..	..
Australia	37	664	67	1,411	32	318
Austria	20,564	246,883	30,043	415,532	32,747	278,322
Bahrain	..	..	125	373	..	..
Belgium	627	4,050	6,388	11,666	4,800	53,052
Canada	..	..	10	354	10,913	30,667
Czechoslovakia	4,397	33,166	784	5,074	41	618
Germany East	..	..	5	610	160	1,951
Germany West	46,168	738,561	70,918	884,984	26,683	459,365
Italy	60,076	341,784	28,049	242,609	11,977	188,634
Japan	16,597	84,238	46,565	258,077	50,097	445,846
Netherlands	1,633	16,916	1,037	13,600	703	8,111
Poland	..	..	2,531	54,161	4,589	37,916
Singapore	..	..	870	490	..	..
Spain	453	13,089	157	4,988	69	1,933
Sweden	18,842	192,881	34,988	290,075	22,658	226,767
Switzerland	25	1,003	1,515	33,570	447	5,127
U.K.	72,467	1,010,331	51,939	729,998	34,028	589,996
U.S.A.	78,898	953,890	43,984	739,296	52,837	831,421
France	563	610	1,058	11,380	..	..
U.S.S.R.	964	8,364	40,430	611,168	42,365	403,621
TOTAL	322,489	3,652,676	361,681	4,310,009	295,146	3,563,665

11. Other Bearings NES

												(In numbers)
Australia	.	.	.	.	.	977	15,029	..	..	..	..	..
Austria	.	.	.	.	.	33,294	368,190	..	..	..	..	..
Belgium	.	.	.	.	.	3,572	4,284	..	..	..	..	..
Czechoslovakia	.	.	.	.	.	14,478	164,009	..	..	..	..	..
Denmark	.	.	.	.	.	14	75	..	..	..	..	..
France	.	.	.	.	.	2,569	73,377	..	..	..	..	..
Germany East	.	.	.	.	.	83	29	..	..	..	..	..
Germany West	.	.	.	.	.	224,923	3,554,238	..	..	..	100	5,974
Hungary	.	.	.	.	.	93	2,827	..	..	..	..	..
Italy	.	.	.	.	.	60,654	804,951	..	..	..	..	..
Japan	.	.	.	.	.	8,426	209,628	..	..	..	..	..
Netherlands	.	.	.	.	.	7,085	64,353	..	..	..	..	..
Norway	.	.	.	.	.	112	1,681	..	..	..	..	..
Poland	.	.	.	.	.	2,374	70,346	..	..	..	..	..
QTR TRL OMN	.	.	.	.	.	15	1,517	..	..	..	..	..
Roumania	.	.	.	.	.	3,120	25,610	..	..	..	..	..
Spain	.	.	.	.	.	106	5,480	..	..	..	..	..
Sweden	.	.	.	.	.	8,486	126,833	..	..	..	..	..
Switzerland	.	.	.	.	.	5,649	87,408	..	..	..	..	..
U.K.	.	.	.	.	.	94,401	1,433,101	..	..	..	..	..
U.S.A.	.	.	.	.	.	32,625	610,026	..	..	..	..	..
U.S.S.R.	.	.	.	.	.	161,259	339,174	..	..	..	..	..
Yugoslavia	.	.	.	.	.	61	4,060	..	..	..	..	..
TOTAL							664,376	7,968,026	..	100	5,974	..

1	2	3	4	5	6	7
I. Total of Ball Bearings of all types and sizes, namely, Sl. Nos. 1, 2, 3, 4, 5 and 6	2,391,157	25,514,343	2,432,866	16,495,385	3,090,051	17,399,093
II. Total of Roller Bearings, namely, Sl. Nos. 7, 8 and 9	768,490	9,308,564	1,723,576	22,950,084	2,551,953	31,122,363
III. Total of other Bearings NES	664,376	7,968,026	..	..	100	5,974
IV. GRAND TOTAL OF I, II and III	3,824,023	42,790,933	4,156,442	39,445,469	5,642,106	48,527,430
V. Total of Parts of Ball and Roller Bearings	322,489	3,652,676	361,681	4,310,009	295,146	3,564,159

APPENDIX X

[Vide paragraph 16]

(i) Statement showing c. i. f. prices received from different sources for ball bearings produced by National Engineering Industries Ltd. (N.E.I.) for which fair ex-works prices have been estimated

(Rs. per piece)

Catalogue	C.i.f. price as furnished by						
	N.E.I. (Hoff- man)	McLeod & Co., Cal- cutta (W.K.)	Bharat Ball Bear- ings Co. (Fafnir)	Cent- ral Trading Co., Calcu- tta (RIV)	Dhiraj- lal and Shankar Co., Bombay (Steyr)	Kamala P. Joshi, Bombay (FAG)	S.K.F. Co., Bombay (S.K.F.)
1	2	3	4	5	6	7	8
<i>Ball Bearings upto & including 25.4 mm Bore (internal) dia.</i>							
110 . . .	1.61	1.55	3.10	1.11	1.52	1.46	1.19
112 . . .	1.64	1.55	3.20	1.44	1.52	1.56	1.28
115 . . .	1.75	1.73	3.35	1.55	1.52	1.68	1.38
117 . . .	1.90	1.90	2.60	1.66	1.62	1.80	1.51
120 . . .	2.26	2.30	3.70	2.11	1.90	2.15	1.82
125 . . .	2.55	2.76	4.25	2.28	2.06	2.46	2.07
310 . . .	2.08	2.19	..	1.28	1.62	1.80	1.38
312 . . .	2.08	2.01	..	1.72	1.62	1.90	1.50
315 . . .	2.08	2.01	..	1.89	1.62	2.04	1.69
317 . . .	2.37	..	..	2.11	2.05	2.32	1.92
320 . . .	2.72	2.53	5.45	3.23	..	2.65	2.13
325 . . .	3.37	3.39	6.60	3.77	2.71	3.55	2.78
S-3 . . .	1.52	1.55	..	1.89	..	1.30	1.08
S-7 . . .	1.87	1.78	3.95	2.17	..	1.72	1.22
S-8 . . .	2.23	1.96	4.45	2.56	..	1.95	1.40
S-9 . . .	2.57	2.30	..	2.89	..	2.20	1.66
LS-5 . . .	2.16	1.61	..	1.50	1.62	1.74	1.32
LS-7 . . .	2.34	1.78	..	1.61	1.71	1.95	1.54
LS-8 . . .	2.52	2.30	..	2.11	2.00	2.40	1.96

	1	2	3	4	5	6	7	8
LS-9 . . .		2.69	2.42	..	3.17	2.19	2.70	2.13
LS-10 . . .		2.98	2.88	..	3.55	2.57	3.15	2.51
MS-8 . . .		2.84	2.59	..	3.39	2.43	2.95	2.29
MS-9 . . .		3.08	2.99	..	3.61	2.71	3.50	2.54
MS-10 . . .		3.75	3.39	..	4.28	3.05	4.10	3.17
N-1025 . . .		..	..	..	1.11	..	1.26	..
U-110 . . .		2.87	2.30	..	2.11	1.86	..	2.02
ULS-5 . . .		3.05	..	..	..	..	..	..
ULS-9 . . .		3.80	3.45	..	4.73	..	3.56	2.83

Ball Bearings above 25.4 mm bore (internal) dia.

L-30 . . .		3.16	..	..	3.61	2.57	3.26	2.74
LS-11 . . .		3.98	..	..	4.17	2.71	3.45	2.97
MS-11 . . .		4.91	..	..	5.06	3.57	5.30	4.06
MS-12 . . .		5.97	..	..	5.55	4.43	6.50	4.58
U-130 . . .		5.73	..	..	..	..	..	..

Adapter Bearings above 25.4 mm bore

UT-145. . .		17.91 (UT145E)	10.06	..	..	..	9.83 (UT145E)	9.77 (UT145E)
UT-155. . .		24.00 (UT155E)	13.00	..	..	..	12.40 (UT-155E)	12.73 (UT-155E)

Ball Bearings above 25.4 mm bore

130 . . .		3.16	3.28	..	3.61	2.57	3.26	2.74
135 . . .		3.69	3.57	..	4.22	3.10	4.44	3.66
140 . . .		3.98	4.20	..	4.84	3.81	5.42	4.22
145 . . .		5.27	4.66	..	5.11	4.19	6.15	5.10
330 . . .		4.04	3.86	..	4.61	3.57	5.50	4.08
335 . . .		4.91	4.77	..	5.17	4.52	6.30	4.78
340 . . .		6.50	5.92	..	6.84	2.24	8.00	6.62
345 . . .		9.14	8.05	..	8.17	1.19	9.82	8.06
350 . . .		10.83	9.89	..	9.44	9.76	11.40	9.78
LS-12 . . .		4.27	3.74	..	4.22	3.29	4.65	3.39
MS-12½ . . .		6.85	5.98	..	8.06	6.33	7.50	5.77
U-140 . . .		7.55	..	..	..	..	..	..
135-ACD . . .		5.68	..	..	5.33	..	5.30	..

(ii) *Statement showing c. i. f. prices of cylindrical and tapered roller bearings produced by Anti-friction Bearings Corporation Ltd. (ABC) for which fair ex-works prices have been estimated*

Catalogue Reference No. ABC	C.i.f. price as furnished by						
	A.B.C. Central (Steyr Trading Bear- Co. (For ings) RIV bearings)	Dhiraj- lal & Shankar Co. (For P. Joshi Steyr & Co. bearings) (FAG)	Kamala (FAG)	SKF Co. Bombay (SKF)	Inter- nation- al Tra- de Links (AKE)	McLeod & Co. Calcu- tta (W.K.)	
1	2	3	4	5	6	7	8
<i>Cylindrical Roller Bearings</i>							
N-205 . . .	5.28	5.17	5.29	5.30	5.35	5.35	4.25
N-206 . . .	6.14	6.33	6.14	6.15	5.60	..	4.65
N-207 . . .	7.19	7.33	7.19	7.39	6.72	..	5.34
N-208 . . .	8.19	8.17	8.19	8.42	7.71	..	6.77
N-209 . . .	9.04	8.73	9.05	9.00	8.34	..	7.29
N-210 . . .	10.19	9.72	10.19	9.70	9.35	..	8.43
N-306 . . .	7.71	7.23	7.71	7.70	7.37	..	5.97
N-307 . . .	8.85	8.84	8.86	9.00	8.48	..	6.88
N-308 . . .	10.42	10.11	10.43	10.35	10.06	..	8.78
N-309 . . .	12.23	12.39	12.24	13.80	11.77	..	10.21
N-310 . . .	14.47	14.17	14.48	15.80	14.20	..	13.14
<i>Tapered Roller Bearing</i>							
30204 . . .	3.57	3.39	3.57	4.20	4.10	3.32	..
30205 . . .	4.05	3.77	4.05	4.60	4.58	3.37	..
30206 . . .	4.14	4.50	4.14	5.50	5.11	3.86	..
30209 . . .	6.90	6.78	6.90	7.84	7.09	5.79	..
30302 . . .	3.28	3.61	3.29	..	3.76	..	..
30306 . . .	5.05	6.00	5.05	6.40	5.76	4.75	..
32211 . . .	9.33	9.44	9.33	11.80	9.64	9.26	..
32212 . . .	11.71	11.28	11.71	14.15	12.15	10.72	..
32214 . . .	16.61	14.50	16.62	18.72	15.89	14.87	..
32306 . . .	6.90	7.55	6.90	8.70	7.16	6.36	..

(iii) Statement showing c. i. f. prices of ball thrust bearings produced by Antifriction Bearings Corporation Ltd., (A. B. C.), for which fair ex-works prices have been estimated

(Rs. per piece)

Catalogue Reference No. of A.B.C.	C.i.f. prices as furnished by		
	A.B.C. (For Steyr)	Dhirajlal & Co., Bombay	
		(For SKF)	(For FAG)
1	2	3	4
06	..	3.08	2.66
09	..	3.80	3.21
010	..	4.00	3.60
011	..	4.08	4.05
012	..	4.50	4.16
014	..	5.56	4.87
016	..	6.00	6.26
017	..	7.47	5.53
022	..	11.03	9.30
T-6	..	3.33	..
T-8	..	3.94	..
T-12	..	7.47	..
T-14	..	9.75	..
T-16	..	13.00	..
T-18	..	18.92	..
T-20	..	45.06	..
T-22	..	48.75	..
FW-1	..	..	..
FW-1½	..	..	..
FW-1¾	..	..	..
B-10	..	..	..
51102	1.52	2.46	2.16
51103	1.62	2.46	2.18
51104	1.76	2.44	2.27
51105	1.90	2.67	2.55
51106	2.05	2.98	2.71
51108	2.86	4.26	3.43
51109	3.24	4.88	3.87
51110	3.57	4.92	4.15
51113	5.43	7.37	5.76
51116	7.19	9.21	7.69
51202	1.62	2.77	2.47

1	2	3	4
51203	1.76	2.77	2.55
51204	2.00	1.88	2.77
51205	2.28	3.18	3.10
51206	2.86	3.88	3.37
51206-A	..	3.88	3.37
51207	3.43	5.49	4.05
51208	4.14	6.44	4.43
51210	5.28	7.34	5.43
51213	8.04	10.67	8.86
51216	10.85	12.73	11.91
51305	3.14	..	..
51309	6.57	..	..
51313	..	..	..





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